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DECEMBER 1985

VOLUME 4, NUMBER 8

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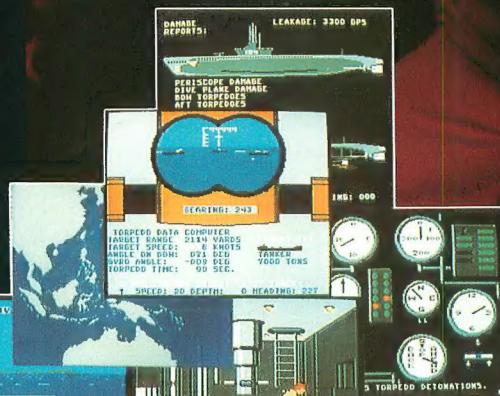
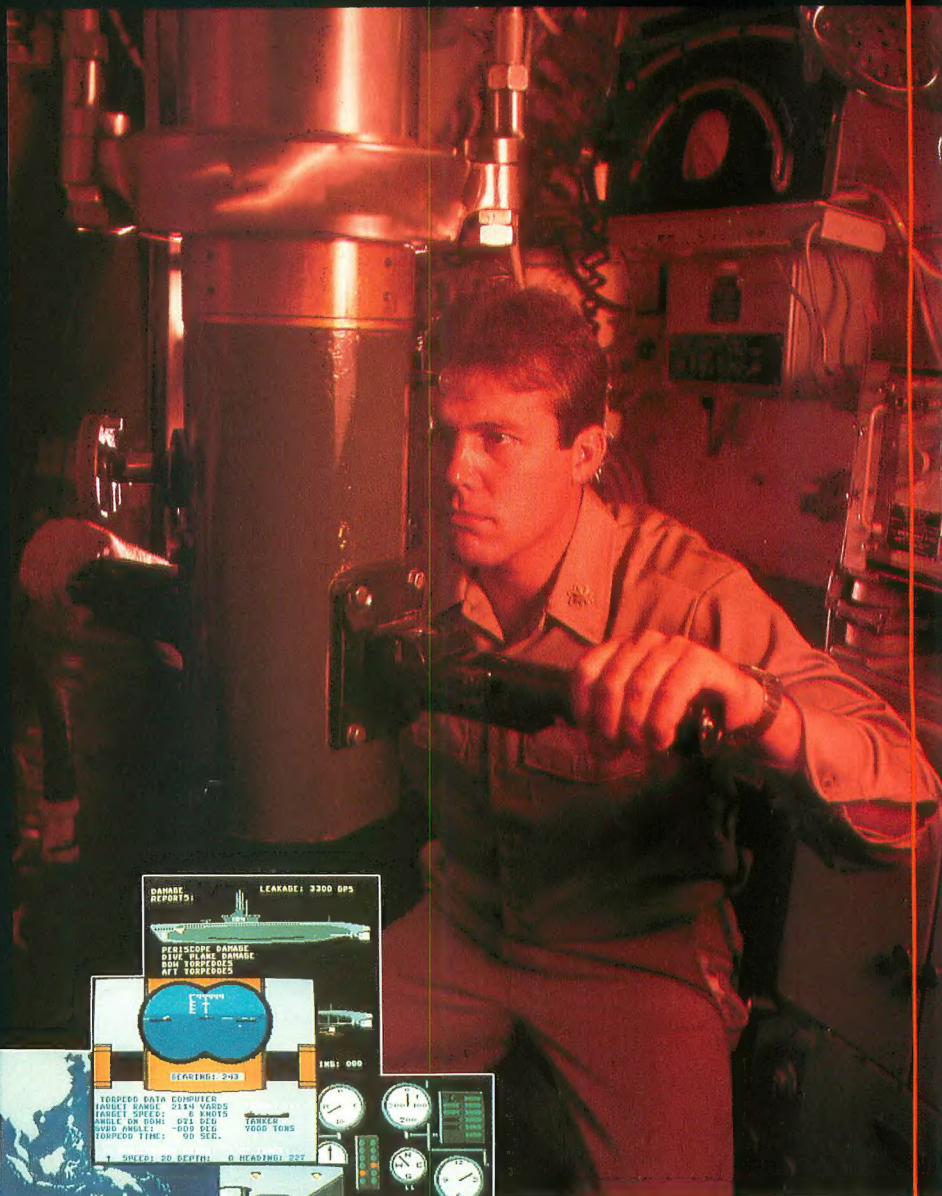
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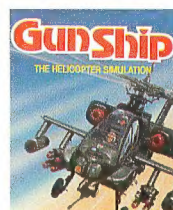
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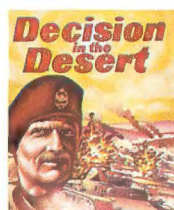
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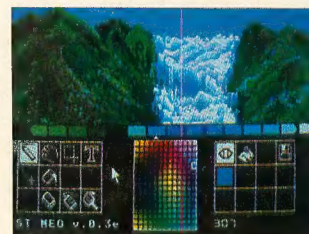
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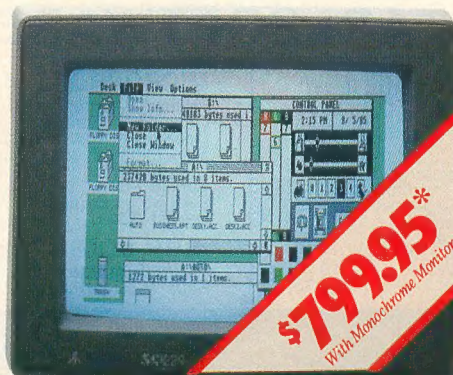
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| Number of Keys                             | 95              | 95            | 59                   | 89                   |
| Mouse                                      | Yes             | No            | Yes                  | Yes                  |
| Screen Resolution<br>(Non-Interlaced Mode) |                 |               |                      |                      |
| Color                                      | 640 x 200       | 640 x 200     | None                 | 640 x 200***         |
| Monochrome                                 | 640 x 400       | 720 x 350**   | 512 x 342            | 640 x 200***         |
| Color Output                               | Yes             | Optional      | None                 | Yes                  |
| Number of Colors                           | 512             | 16            | None                 | 4096                 |
| Disk Drive                                 | 3.5"            | 5.25"         | 3.5"                 | 3.5"                 |
| Built-in Hard Disk<br>(DMA) Port           | Yes             | Yes           | No                   | No                   |
| MIDI Interface                             | Yes             | No            | No                   | No                   |
| No. of Sound Voices                        | 3               | 1             | 4                    | 4                    |

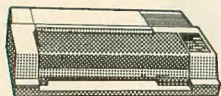
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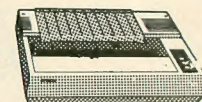
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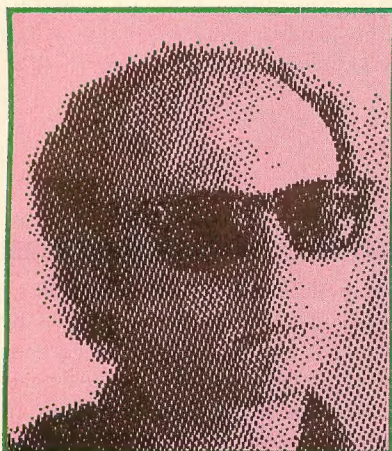


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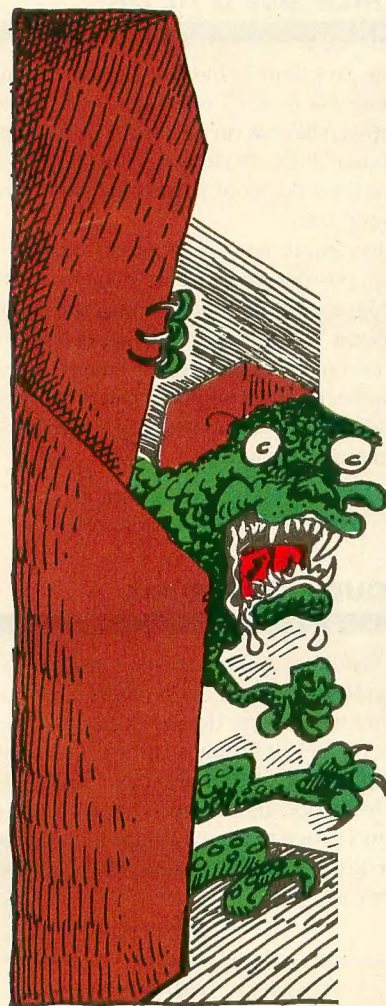
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## i/o board



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System: Quantel Paintbox, Varitel  
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### LUCKY STRIKES?

I have had my Atari 800 for two years and I've been using it every day (except when I was on vacation) and I have never had a single problem yet.

But one day I was using my computer during a thunderstorm. With my good luck, the lightning had already blown up my computer drive and my modem. At least I was not using all my equipment at the time. So I brought my 800 computer to a computer store to get fixed and I left it there.

A week later, I came back to bring it home again. But when I arrived at the store, my good luck happened to me again. Before my eyes, I found the store in flames!

I talked to my insurance company and they said they would buy me a new computer. Then the computer store owner guy also said he would buy me another new computer. At that moment, I realized I could buy almost *any* computer I wanted.

So, I went to the store and I looked at a lot of PCs. But I only want another 800 (not an XL). No matter what price I offer

and no matter how hard I look, I just can't get my hands on another Atari 800. Can anybody help me out?

Chris Puzzele  
Milltown, N.J.

### NEW BBS LIST ONLINE

Temple (Texas) ACE has set aside 170K on our group's Poor No Name BBS for the purpose of maintaining the most accurate and up-to-date list of Atari-oriented bulletin boards possible. Please leave your information on our BBS at (817) 778-2506. My CompuServe ID is 74206,1464.

James Weslowski  
Temple, Texas

### WHICH SIDE IS HE ON?

If, as Jack Tramiel has been known to say, "business is war," I wonder which side Trip Hawkins is on. His letter in the September, 1985 **Antic** is not the first time I've seen skeptical comments from him about Atari.

Electronic Arts has adopted a "wait and see" posture towards the new Atari STs while eagerly jumping aboard the Commodore Amiga and 128 bandwagon. I question the accuracy of his figures on the number of Atari computers and disk drives sold, I have seen authoritative higher estimates elsewhere.

Arthur Horan  
Brooklyn, NY

### DOUBLE QUADRUPLE

In Matthew Ratcliff's **Antic** program "Custom Print" (March, 1985) there is an option for quadruple density dot graphics on the Gemini 10X printer. Did you know the Panasonic KX-P1091 also has a quadruple density dot graphics mode? To modify Matt's program for the Panasonic, change the lower case "z" in line 320 to an upper case "Z".

Anil Prasad  
London, Ontario  
Canada

continued on page 8

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# i/o board

continued from page 6

## BLUE MAX BLUES

A short time ago, I purchased a new 130XE computer to replace my old battle-scarred upgraded 400. But I found that when I tried to load the Synapse game **Blue Max**, I kept getting the familiar "Please Remove Cartridge" message on the screen. Even using the advice given in **Antic** about Translator, I could not get the program to load.

Marty Saletta  
Dunkirk, New York

*Broderbund told Antic that of all their games, Blue Max and Dimension X are the only ones that don't load on the 130XE and they're not sure why.*

—ANTIC ED

## ENCORE, ENCORE

I can't thank Angelo Giambra enough for "Musician" (**Antic**, June 1985). I sing in a church choir and now I can listen to my best church music on my Atari!

Don't ever stop printing programs for the 800XL! I bought my Atari 800XL about four months ago and am very happy with it. I really like typing in programs. It seems to relax me.

I'm getting started late at my age, (I'm 34), but someday I'll be a good programmer!

David Shatraw  
Rochester, NY

*Don't worry, Antic is NOT about to turn its back on the million-plus users of 8-bit Atari computers.*—ANTIC ED

## OKI MATES

Will Broderbund's **Print Shop** be coming out with a version for Okimate 10 color printers? Any similar programs that you can tell me about that will run with the Okimate would be greatly appreciated.

Timothy Dale  
New Orleans, LA

*As far as we have been able to find out, Broderbund does not have a color Print*

*Shop version in the works. RAMbrandt (Antic Catalog, API57) has the best Okimate 10 color dump available.*—ANTIC ED

## A POKE CHEER

Here's something you probably didn't know was tucked away inside your Atari.

```
10 S=53760:POKE S,230:P
OKE S+1,175:POKE S+2,23
1:POKE S+3,175:POKE S+4
,229:POKE S+15,3
20 FOR X=0 TO 255.49 ST
EP 0.135:POKE S+8,X:NEH
T X:GOTO 20
```

Lloyd Burchill  
Newcastle,  
New Brunswick  
Canada

*No, it will not format your disk.*

—ANTIC ED

## CHROMA I/O

*Antic received many letters asking about the 130XE's separate chrominance and luminance (XLs do not have this). These helpful responses came via the ANTIC ONLINE electronic I/O Board.*

—ANTIC ED

From Ray McGoldrick (76556,710): I found that the 130XE does support chroma output on the same pin as the old 800. It's true that the 800XL has no output to the chroma pin. But I had good results using the video output in place of the chroma output. The picture is not as good as with true chroma input, but seems to be better than the straight video. I own a computer retail store here in Alaska and have a 130XE running an Amdek color 300 monitor with the chroma and luma inputs going in right now.

From regular **Antic** author Matthew Ratcliff (75756,2710): I send the 800XL composite video to the composite chroma input at the back of a Commodore 1702 monitor. This gives a sharper picture than just using the video input at the front of the monitor. No problem.

## AT YOUR SERVICE

A Long Island Atari repair facility that was on your list of Service Centers earlier this year is no longer in operation. However, Island Video Computer Service in Coram, NY is alive and well. And they did an excellent job of fixing my 1027 printer.

B.J. Freeman  
Wantagh, NY



# help!

## PRO\*TERM DOWNLOAD

**Antic** received several complaints from readers unable to download large binary files with Pro\*Term (August, 1985).

In response, **Antic** re-tested Pro\*Term on CompuServe and the program passed every test, successfully downloading several large files in XMODEM protocol, including two 412-sector binary files.

## SUPRA 503

The (503) area code was misprinted in the phone numbers for Supra Corp. on the page 10 story in **Antic** last month. Supra's correct Technical Support number is (503) 967-9081. The correct number for ordering Supra products is (503) 967-9075.

## ST SOUND EXTRAS

The C listing for ST Sound (November 1985) appeared with three extra garbage characters at the right end of the 11th line down from the start of the DO...WHILE loop on page 68. The correct line is:

```
note_10 = (x_note & 10_mask);
```

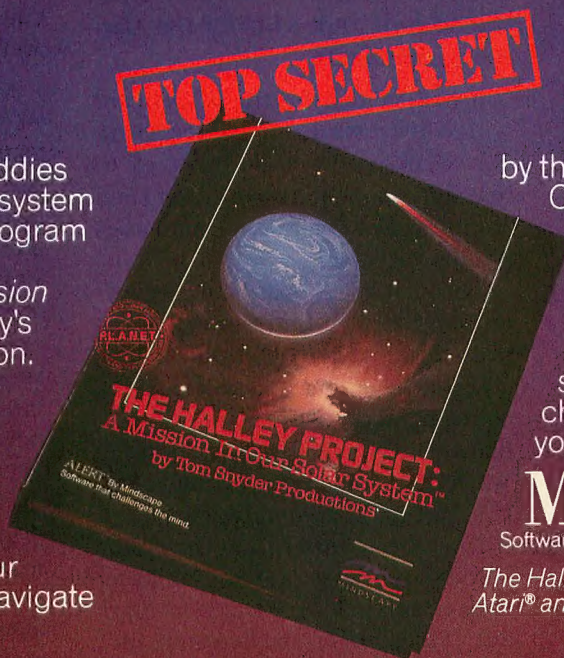


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## antic online



Type GO ANTIC when you log onto CompuServe in November. This month on ANTIC ONLINE you'll find in-depth reports about the first meetings of the full Board of Directors of the Worldwide Users Network, including the charter slate of Atari users group representatives.

### CHARTER MEETING

The opening online meeting of the WUN Board of Directors took place on August 28. Agenda topics covered were:

- WUN support commitments from corporations represented by the directors.
- Varying viewpoints from the directors about what services WUN should seek to provide for the Atari users community.

It was decided that the WUN board will confer via CompuServe every two weeks. WUN will also seek to maintain online the most current and complete list of worldwide Atari users groups available.

The next WUN board meeting was to take place in mid-September. Its main business would be to nominate and vote on users group officers to become members of the board. Current plans called for at least 10 users group WUN directors representing major U.S. and international regions.

Directors logged on for the online conference were Antic Publisher James Capparell, Neil Harris of Atari, Rob LaFulipe of Digital Research, Inc., Michael Reichmann of Batteries Included and SIG\*Atari Sysop Ron

Luks. Sig Hartmann of Atari was unable to attend due to a last-minute corporate meeting.

Chairman of the session was WUN Co-coordinator Gary Yost, Antic Catalog marketing director. Also on hand at Antic's terminal were WUN Co-coordinator Nat Friedland and WUN Corresponding Secretary Rebecca Hale.

### WUN COMMITMENTS

Michael Reichmann from Batteries Included, the software publishing company whose products for Atari include **Paper Clip** and **HomePak**, said that BI would provide "modest financial backing" for WUN. The company also would be willing to host in-person meetings of WUN representatives in its suite at future Consumer Electronics Shows.

Rob LaFulipe from Digital Research, the company that developed the GEM icon desktop software for the ST computers, said that DRI saw itself as "the new kid on the block" in terms of the Atari users community. He expressed the hope that WUN could be a bridge between Atari users and Atari suppliers.

James Capparell pledged that Antic would continue contributing organizational effort plus online and print resources until WUN was able to stand on its own. At that point Antic would leave the forefront and simply participate in WUN as one of the corporate members. However, even then Antic will keep providing late-breaking Atari news and in-depth information online for users group newsletters to download and reprint.

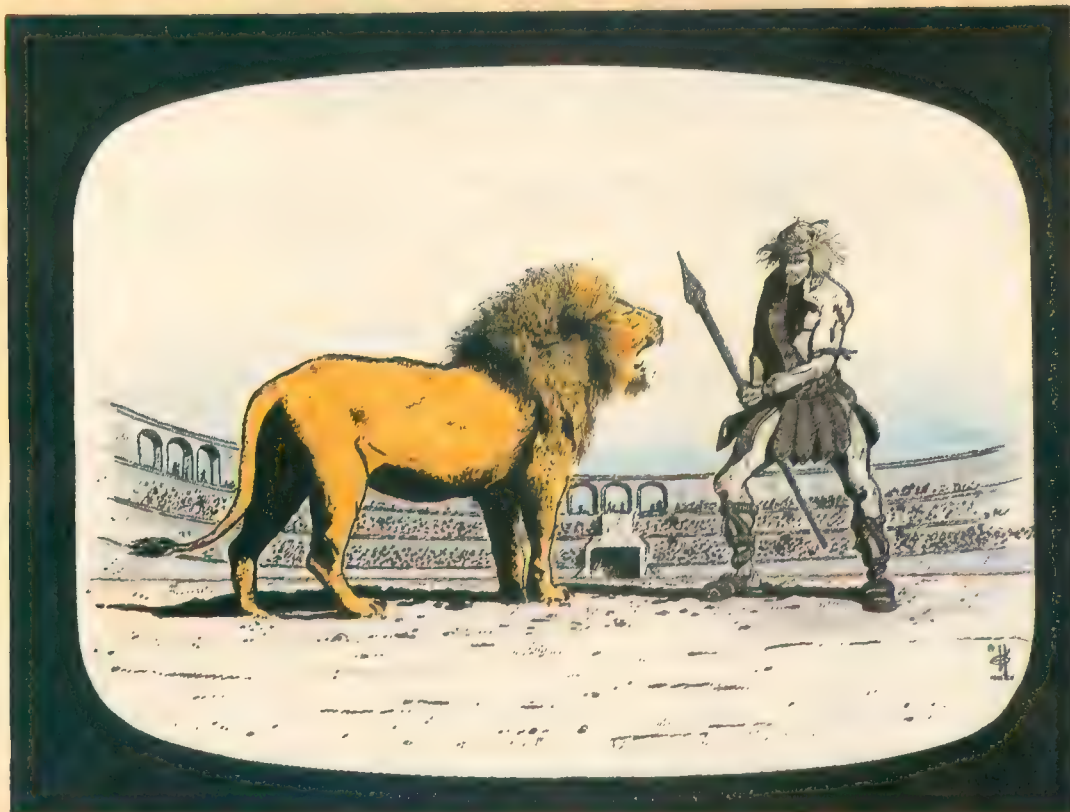
If you're not a CompuServe subscriber yet, see your local computer dealer or phone (800) 848-8199 for information about signing up. Ohio residents phone (614) 457-0802. There is no extra charge for accessing ANTIC ONLINE.



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# BBS CRASHBUSTER

## *Foil those evil bulletin board crashers*

by MATTHEW RATCLIFF

*Bulletin board sysops can now foil destructive "crashers" with this machine language USR call. BBS Crashbuster quickly strips all non-standard ATASCII characters from input strings. The BASIC demonstration program runs on all Atari 8-bit computers, with disk or cassette. We also included the source code for non-sysop assembly language mavens.*

A genuine concern for any system operator (sysop) of an electronic bulletin board (BBS) is "board crashers" who try to shut down the BBS by sending invalid string characters. (*Antic* won't encourage this destructive behavior by including any examples.—ANTIC ED)

The Atari BASIC INPUT statement gives you very little control over the characters allowed. Most often, the sysop installs a slow FOR-NEXT loop to check a string for invalid characters before accepting it. This wastes time and precious memory.

### BASIC DEMO

Listing 1 is a short BASIC demonstration program containing a machine language (ML) routine that checks your input string for invalid characters and translates them to normal ASCII printable characters.

The variable in the USR call at line 1000 (A=USR...) returns one of several values. A zero means that all is well and no invalid characters were in the string. A number between one and 255 is a count of the number of invalid characters that were found and corrected.

The USR routine also checks for invalid call formats. The program must have the string address followed by the string's length, which must be between one and 255. If one of these parameters is left off, or if you have too many, the ML routine will return safely to BASIC with a value of 256 in the calling variable.

### TYPING IT IN

Type the BASIC listing carefully and check it with TYPO II. If you're good at typing Atari special characters, type line 1000 as is, and don't bother typing line 15 and the lines from 2000 to the end. *Antic* Disk subscribers simply type RUN "D:CRBUST.BAS" to use the program.

For those of us who don't like typing special characters, line 1000 will be created by lines 15 and 2000-etc. Should you decide to use these lines, skip line 1000 and type in the rest of the program. Check Listing 1 with TYPO II and SAVE a copy before you RUN it. Line 1000 will be printed on the screen, along with the unneeded

line numbers. Move the cursor to each line number and press [RETURN]. The resulting program, consisting of lines 5 through 1010, may now be SAVED.

When RUN, the program will prompt you to enter a string. It will then print the converted invalid characters in L\$ and the total number of these "garbage" characters.

This routine should save budding sysops a lot of headaches with would-be crashers. But also, if you are writing any type of program that expects normal keyboard inputs, this routine can quickly clean up your strings.

Listing 2 is the assembly language source code. Disk subscribers will find it on the monthly disk as CRBUST.M65. It need not be typed in, but you will require the MAC/65 assembler, cartridge if you wish to modify it. The source code can be easily modified for different types of translations. For example, you can also check for lower case characters and convert them directly to upper case.

*Matthew Ratcliff is one of Antic's most dependable high-level programmers.*

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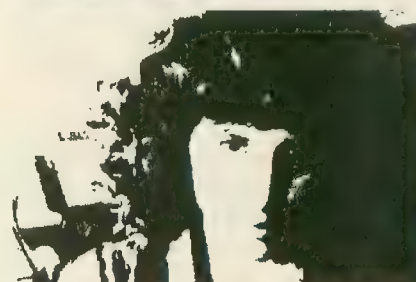
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# VIDEO STAR ATARI

*Computereyes . . . plus other  
new graphics goodies*

by CHARLES JACKSON, **Antic** Program Editor



One week after **Computereyes** arrived at **Antic**, we finally put away our videocamera long enough to start writing a review.

Digitizing images with your Atari has never been simpler—or more fun. Aim your camera, press a key, and **Computereyes** does the rest. Within a minute or so, the digitized image appears on your video screen, ready to be **SAVED** to your disk as a 62-sector picture file.

To use the **Computereyes** system effectively, you need a standard video camera. Or you can buy Digital Vision's \$399.95 version that includes a basic b&w camera.

Although **Computereyes** accepts any type of video signal, **Antic** was able to produce much better images

with a videocamera than by using "freeze-frame" on a videocassette recorder.

Digital Vision president Dave Pratt told us that many people have successfully used **Computereyes** with the new 4-head and 8-head VCRs. These models produce cleaner freeze-frame signals than older VCRs we had available for testing as of this writing.

The **Computereyes** interface is a black plastic box about the size of an Atari power supply. It has two cables that plug into joystick ports 1 and 2, plus a female RCA jack which accepts the incoming video signal cable. It also has two knobs that control the video signal brightness and synchronization rate.

**Computereyes** software supports five different digitizing "capture"

modes. Three of these formats use Graphics Mode 8, the remaining two use **ANTIC** Mode E (Graphics 7 1/2). Image capture times range from 7 to 52 seconds, depending on the mode.

The 4-Level and 8-Level captures produce "textured" images which reproduce well on dot-matrix printers.

A 16-level GTIA capture mode using Graphics 9 will soon be available for about \$15, said Digital Vision's Pratt, "It will be a software enhancement available on a separate disk."

Pratt added that he would have brought out the Atari version of **Computereyes** much sooner if he had realized how fast sales would take off, compared to the earlier Commodore and Apple II editions. "Atari users seem to be heavily into graphics and video," he noted.

# COMPUTEREYES



## ANTIC CONNECTIONS

Computereyes programmer Jim Bergman is working on a new version that will save images in KoalaPad format. Until then, you can use Rapid Graphics Converter from the November, 1985 *Antic* to adapt your Computereyes pictures to Micro Illustrator format (KoalaPad, Atari Touch Tablet or Light Pen, etc.). To fade between Computereyes images in a flashy video slide show, use Fader II (*Antic*, May 1985).

And to convert your final digitized video image into a Print Shop file for making letterheads and greeting cards, use Graphic Shop (see following review).

Samples of the images made by *Antic* during our week of obsession with Computereyes are in SIG \*Atari, on

CompuServe or Delphi. On CompuServe, goto to DL4 and download GIGI.XMO, JULIA.BIN, and NAT.XMO. These images of *Antic* staff members were recorded with Computereyes, then converted with the Rapid Graphics Converter for manipulation in KoalaPad format.

For a sample Computereyes Print Shop graphic in SIG \*Atari DL4, see STEVE.XMO. The image was created in Normal Capture mode, then converted into a Print Shop graphic with Graphic Shop.

## DRAWBACKS

Computereyes has some minor flaws. First, the program is inconvenient to operate. There's no practical way to preview your image before you digitize it. You must keep plugging and

unplugging your camera between the monitor and the interface in order to set up a shot and digitize it.

Computereyes is also comparatively expensive, especially if you don't already own a videocamera. For \$399.95, you could easily buy a new 130XE computer and a disk drive. Although Computereyes might be beyond a casual user's budget, it would be a great investment for user groups, businesses and schools.

**COMPUTEREYES**  
Digital Vision, Inc.  
14 Oak Street, Suite 2  
Needham, MA 02192  
(617) 444-9040  
\$129.95, 48K disk  
(\$399.95 with camera)

continued on page 17

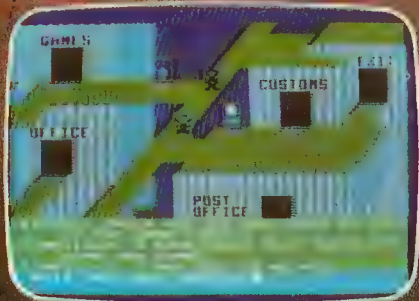
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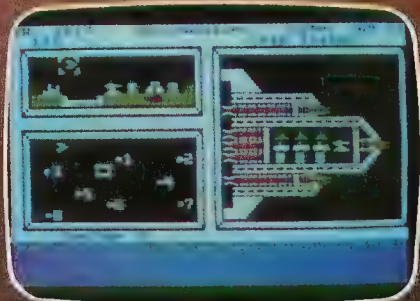
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## RAMBRANDT

**RAMbrandt**, by Bard Ermentrout, is a powerful drawing program that belongs in the paintbox of every serious electronic artist.

The program offers a grand array of tools you can use to create and modify pictures in Graphics Mode 7, Graphics 7 1/2 (ANTIC Mode E) and all three GTIA modes.

RAMbrandt boasts a host of spectacular functions which can't be found in any other drawing program. Its Windowing function can magnify and reduce screen objects, flip them horizontally or vertically, rotate them in five-degree increments, even *animate* them.

RAMbrandt's animation function lets you create and animate short scenes, then view them in a small window. Used with GR. 7, RAMbrandt's Animation can even be used to enhance Moviemaker (Reston) background files.

RAMbrandt has more than six dozen commands. These include user-defined brushes and texture fills, airbrushing, "rubber band" ellipse, circle and box modes, transparent overlays, cut-and-paste windows which can be scaled in size, an "Exclusive-OR" brush, a color-oriented "search-and-replace" brush, mixture of text and graphics, and many, many more.

RAMbrandt can also SAVE and

LOAD Micro-Painter and Micro Illustrator (KoalaPad, etc.) files.

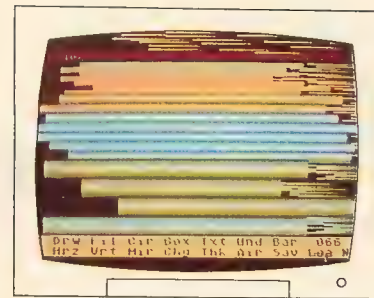
RAMbrandt is written in Forth, which means that disk access and pattern fills are considerably slower than similar functions found in machine-language drawing programs.

Also the program has some trouble LOADing Koala pictures, completing certain user-defined pattern fills, and handling user-defined functions from the touchpad mode.

One of RAMbrandt's nicest features is the UNDO command. This lifesaver erases the last graphic command you entered. If you put a pattern fill in the wrong place, if a line isn't straight, or if you accidentally erased a piece of your screen, UNDO corrects the damage.

RAMbrandt is a command-driven program which does not have the colorful, happy menu icons prevalent in simpler drawing programs. It is not a toy. It is made for the serious computer artist who wants more powerful graphics software. Although casual artists may find the program "too hard" to use, serious microscreen artists will find RAMbrandt a powerful and invaluable graphics tool.

RAMBRANDT  
Antic Catalog  
AP157  
\$19.95, 48K disk



## BASIC TO MICRO ILLUSTRATOR

Bonus Disk Images

Antic Disk subscribers have an unusual bonus this month! We put several of our favorite Computereyes images on this month's disk in Micro Illustrator format.

In case you don't own Micro Illustrator software (It's provided with most touch tablets and light pens), we've also included VIEW.BAS, a short BASIC program that decompresses and displays pictures created with Micro Illustrator.

VIEW.BAS runs on all 8-bit Atari computers. It is printed in the current issue's type-in listing section as well as being on the monthly disk. If you type VIEW.BAS, check it with TYPO II and SAVE a copy before you RUN it.

## HOW IT WORKS

To load a Micro Illustrator picture, RUN the program, then enter the picture's filename. VIEW.BAS does the rest.

The USR call in line 210 changes a GRAPHICS 8+16 (ANTIC Mode F) display list into an ANTIC Mode E display list. The USR call in line 230 decompresses and displays the picture file. This USR call uses a machine language routine stored in MAIN\$, and a routine stored in Page 6. The latter routine is POKEd into memory in lines 100-130.—CJ

Listing on page 93

continued on next page

# Antic

The ATARI Resource

Coming Next Month

## Return of the Atari Products

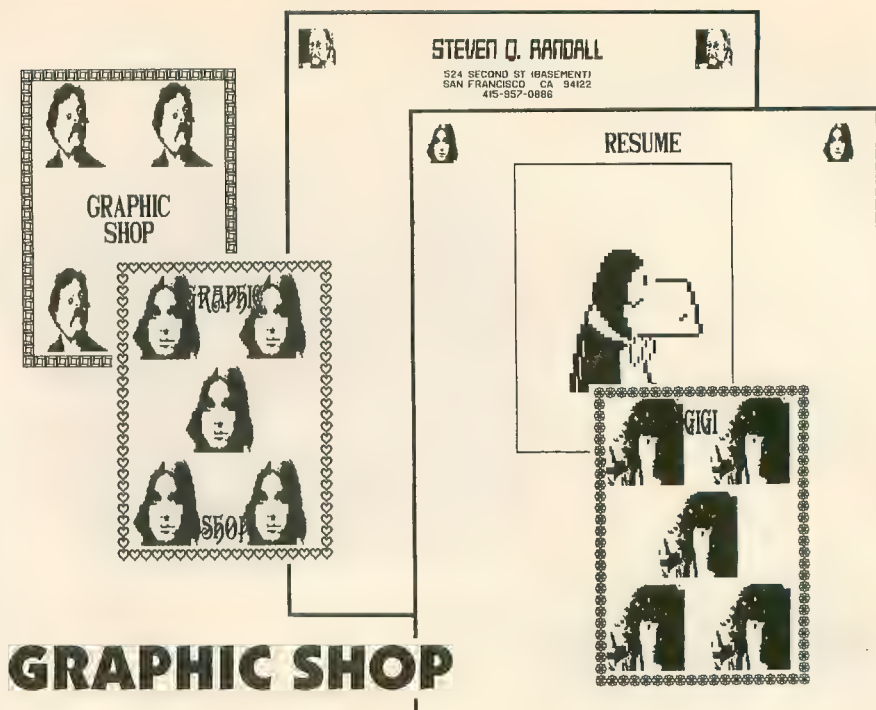
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Ian Chadwick  
Maps XL/XE



Yes, I co-wrote this program with Darryl May. But just so you don't think this review is biased, I'll be careful not to tell you whether or not I think **Graphic Shop** is any good. I'll just describe what it does.

Graphic Shop can take any picture created with Micro-Painter or Micro Illustrator (KoalaPad, Atari Touch Tablet or Light Pen, etc.) and turn all of it—or any section of it—into a graphic that can be **SAVED** to a Print Shop disk.

You can also use the program to format Print Shop data disks and to view directories of DOS 2 or Print Shop data disks.

Graphic Shop was designed to be as easy to use as Print Shop. Both use the same type of menus, and both can be used without reading many pages of instructions.

From the Main Menu, you can load KoalaPad or Micro-Painter pictures, view disk directories, or create specially-formatted Print Shop data disks.

Once a picture is loaded, you can convert your picture in one of two ways:

1. You can use your joystick to position a small, blinking frame over a portion of your picture and convert only that portion.
2. You can compress the entire screen into a Print Shop graphic.

Because Print Shop does not support high-resolution graphics, some of the finer details of your microscreen may be lost when you use the second option. This option takes longer than the first because it is squeezing more than 7,000 bytes into less than 600 bytes.

Graphic Shop translates your four-color microscreens into two-color Print Shop graphics by using black fills and white fills for two of your microscreen's color registers, and pattern fills for the two remaining color registers.

Next, a four-window Preview Screen lets you decide which parts of your picture will receive pattern fills, and which parts will be solid. Choose the image you like best, and Graphic Shop will save it to your Print Shop data disk.

If you don't like any of the conversions, you can return to your picture and try again.

Graphic Shop also has a "smart" disk directory routine. The program determines whether a Print Shop disk or a DOS 2 disk is in drive 1, and then displays the appropriate directory.

GRAPHIC SHOP  
Antic Catalog  
AP156  
\$19.95, 48K disk



# NEW LUCASFILM GAMES:

*Antic's Sneak Preview —*

*The Eidolon and Koronis Rift*

by JACK POWELL, *Antic* Technical Editor

**H**ere's an *Antic* sneak preview of the latest Lucasfilm Computer Games—two impressive new releases, **The Eidolon** and **Koronis Rift**. By the time you read this, they should be available from Epyx Software, 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700.

## BEHIND THE SCENES

One sunny summer day, *Antic* arrived at Lucasfilm's Marin County industrial park and was led through labyrinthian corridors to the Computer Games Division.

On the way, we passed through The Droid Works, a Lucasfilm spin-off company, and glimpsed the state-of-the-art computerized video/film editing machine. Two of the machine's three screens showed Luke Skywalker bending over a dying Yoda.

Twisting up one stairway, down two, and through several corridors we came at last to a room filled with microcomputers and monitors of every shape and type. IBM PCs, Apples, Commodores and—of course—Ataris.

While waiting for the programmers to arrive, our guide Julia McHugh showed us an adjoining room filled with coin-op arcade game machines, including such rarities as *The Empire Strikes Back*, and *Return of the Jedi* featuring the jetbike forest chase. Lucasfilm management cannily offers a creative, meditative oasis from hours of intensive programming—thereby encouraging further creativity.

## THE EIDOLON

Exploring an old abandoned house, you come upon a dusty, faded diary belonging to a 19th century crackpot inventor. The diary is stained and difficult to read, but you make out references to a strange machine and many journeys through an alternate world of caverns and monsters. You really don't learn much from the vague, cryptic passages. And the diary ends abruptly and ominously, with a hint that its author never made it back from his last sojourn.

Wandering further, you come upon the machine itself—looking very much like a George Pal creation. Being a reckless, adventuresome sort, you hop into the machine, pressing

buttons and throwing levers until, with a click and a whirl, you suddenly find yourself in . . .

A huge maze of gray caverns is where the game really begins. The caverns are generated by fractals and, as you wander, the stalactites and arches move overhead much like the mountains and landscape of *Rescue on Fractalus*.

As you journey through the caves, you see flickering fireballs and mystical, floating gems. In certain grottoes are statues of odd, mishapen creatures. You draw near one particularly repulsive beast and suddenly it changes color, comes to life and begins pursuing you!

## 3-D FANTASY

As conceived by Project Leader Charlie Kellner, *The Eidolon* is a point-of-view fantasy role-playing game with ten levels of complex mazes. Your goal is to find a dragon on each level and figure out how to vanquish it to get to the next level.

Kellner told us that a large part of the game's challenge is figuring out the rules of this strange world. The documentation will be purposely ambiguous—and *Antic* isn't going to spoil the fun by giving away details.

We can tell you that there are a lot of marvelously animated creatures populating the caverns. And every level contains a different cast of characters. They all have individual intelligences, powers and vulnerabilities. Your job is to figure out how to deal with them.

## EIDOLON TEAM

Project Leader Kellner was responsible for some of the sound and the flight dynamics in *Rescue on Fractalus*. (See *Antic*, August 1984.) Before coming to Lucasfilm, he worked at Apple in the Education Department.

He began to realize the real way to educate was with game technology—teaching by computer-created simulations. "After all, a physics lab is nothing more than a simulation, and this can be done on a computer."

He'd always been interested in games, both as a designer and a player.



Eidolon programmers (from left) Douglas Crockford, Gary Winnick and Charlie Kellner.



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But he didn't have much opportunity to do this at Apple. "I discovered 2 1/2 years ago that George Lucas was starting up a game division and . . . that was it."

If you've ever been attacked by the Jaggi Monster in *Rescue on Fractalus*, you've seen the work of Gary Winnick. He is also responsible for the Lucasfilm title logo and the introduction animation in *Ballblazer*. (See **Antic**, August 1984.) For *The Eidolon*, Winnick is in charge of graphics, plus the design and animation of all the creatures.

Winnick began as a commercial artist with an interest in animation and film. "When computers came along, I bought an Atari and started fooling around with it." It wasn't long before he was working at Atari. He and Charlie Kellner became friends, and in a short time Winnick found himself at Lucasfilm. "It all happened real fast."

Kevin Furry is converting the game to the Commodore 64 in parallel development. The original code for *The Eidolon* is written on a VAX minicomputer before the graphics are separately designed on the two target computers.

Furry developed graphics hardware and software packages for the Mind-

set computer. "My brother bought a Commodore. Like any programmer, you can't keep your hands off the toy at home."

The fourth member of *The Eidolon* team is a familiar name to **Antic** readers: Douglas Crockford, creator of *Galahad and the Holy Grail*, *Burgers!* and other games available through the Antic Arcade Catalog.

Crockford is developing sound and music for *The Eidolon*. He also developed a technique permitting full screen animation during disk access. This technique is being used in both new games and can be seen in action during the introductions to *Ballblazer* and *Rescue on Fractalus*.

Crockford was invited to the Atari Research division by Chris Crawford, who was impressed with *Galahad*. Before coming to Lucasfilm, he worked briefly for National Semiconductor.

### A.C.E.

One of the most fascinating elements in *The Eidolon* is the huge collection of animated creatures which populate the underground world. **Antic** was shown the design utility program which makes this new technique possible.

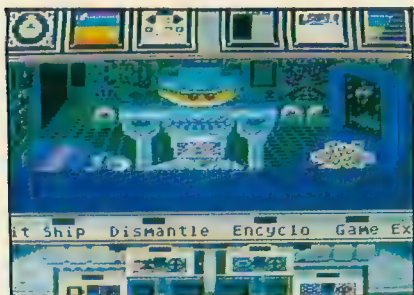
Tentatively named A.C.E. (Ani-

mated Cel Editor), the program was written by Charlie Kellner and is used by Gary Winnick to design and animate the creatures. It's based on the classic animation technique where moving parts of a character are inked on transparent cels (short for celluloid sheets). Several layers of cels make up one image which is animated by moving the cels.

To demonstrate this on A.C.E., a dragon was brought to the screen. An animation window was assigned to each of its main parts—head, wings, tail, etc. When the animation cycle of the neck window was run, the neck snaked around in a circular path. The head—in a separate window—rolled its eyes and opened its mouth. By then attaching the head window to the neck window, the growling head followed the circular path of the neck. In this way, detailed creatures with complex, bit-mapped animation can roam freely about the caverns.

Winnick showed off an A.C.E. rogues gallery of trolls, orcs, and other oddities. The creatures are distinctly cartoon-like and substantially bigger than any seen in previous microcomputer games.

continued on next page



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Koronis Rift programmers (from left) Ron Gilbert, Aric Wilmunder, Noah Falstein.

Photography Linda Tapscott

## KORONIS RIFT

You're a down-and-out techno scavenger in the year 2049, exploring the Koronis Rift. When the Ancients abandoned this mountainous planet, they left behind priceless artifacts of their superior weapons technology. They also left behind a race of mean, trigger-happy saucer people.

If you can collect enough weapon system artifacts—and figure out how to use them—you're a made man. If the saucers get you, you're a dead man.

You travel the fractal landscape of the planet in your surface rover. When you come upon an ancient hulk, you send your droid out to retrieve the weapon system inside. You may be able to put the system to immediate use against those pesky saucers which, even now, are attacking with multi-colored lasers.

After filling your craft with weapon systems, return to your scout craft and run the collected systems by your science droid for instant analysis—assuming he can figure them out!

## STRATEGIC SHOOT-UP

Noah Falstein is Project Leader and main designer of Koronis Rift, which

he describes as a strategy game in an action format. "On a primary level, it's a standard shoot-'em-up. Someone who likes that sort of thing can jump in there, blow up anything that moves and have a good time."

But on another level, Koronis Rift is a multi-layered strategy game where colors and shapes are important clues to the function of the collected weapon systems. A red laser may work fine against a blue saucer, but may be worthless against a yellow one.

Game documentation will contain descriptions of the various planetary cultures and the icons representing them. Since you can identify the race that developed a weapon system by the shape of the hulk, this may give you a clue to its function. Your science droid may be able to help you—or you might just have to try the system and see what it does.

There are many different types of weapon systems with varying properties and power requirements. One may help you past a rough part of the landscape by blowing up a mountain—but will completely drain your shield power!

The landscape of Koronis looks similar to Fractalus, but with higher mountains. A new programming tech-

nique blends fractals and GTIA Mode 9 to create an illusion of misty depth much like classic Japanese paintings.

## KORONIS TEAM

Project leader Noah Falstein began his computer gaming career when a college professor recommended him to the electronics division at Milton Bradley. After 2 1/2 years there—during which every project he worked on was cancelled—he moved on to Williams Electronics in Chicago where he worked on arcade game design. He came to Lucasfilm when Ballblazer and Rescue on Fractalus were in their final stages of development.

Aric Wilmunder is called the "speed demon" of the Koronis team. Wilmunder is responsible for refining and speeding up the game's routines and designing the explosions and scaling routines for the saucers and droids. He spent 2 1/2 years at Automatic Simulations—now EPYX. Wilmunder also worked for one year with Doug Crockford at Atari Research and another year at Atari's Coin-Op division.

Ron Gilbert is converting the game to the Commodore 64. Prior to Lucasfilm, he was with Human En-

gineering Software. Additionally, he and Wilmunder have been working on speeding up the frame rates of Koronis to make it more lively for the action gamer.

Gary Winnick of the Eidolon team is also working on Koronis, designing the shapes of the saucers and the artifact hulks.

Doug Crockford is designing sound for both games. When we saw Koronis Rift, a randomly generated snare drum gave the game a military feel. "Charlie needs a dragon that sounds like a walrus, and Noah needs a robot that sounds like a walrus. It saves a lot of time."

Jim St. Louis is an artist as well as a programmer. He's probably best known in the Atari community as the co-creator—with Russ Karas—of the Robot and Rocketship graphics demos released by Atari.

St. Louis also created a robot—the science droid—for Koronis Rift. And his incredibly detailed rocketship animates the title screen of Rescue on Fractalus. Prior to joining Lucasfilm, St. Louis worked on computer graphics at Datamost and Disney T.N.T.

## WHAT'S NEXT?

As we left the Lucasfilm complex—our eyes blinking in the bright, summer sunlight—we thought about our parting conversation with Steve Arnold, Director of the Games Division.

We had noticed among Lucasfilm personnel much use of the phrase "interactive entertainment." So we asked what new projects were in the works from the Marin magic factory. Arnold told us that specific projects could not be discussed at this time. He then added, with a cheshire grin, "There are significant new kinds of experiences available for bringing together computer and film. . ."



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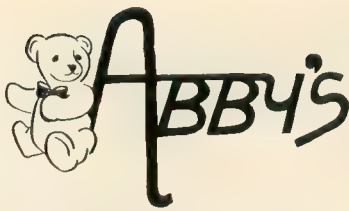
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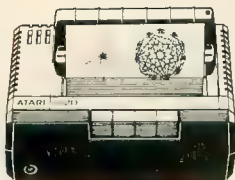
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# DISKIO PLUS

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*Last January, Antic published one of our most popular and useful programs—DISKIO by Dr. Bernard Oppenheim. It was a resident disk file utility that permitted most disk operations to be accessed directly from BASIC or Atari Assembler Editor with quick, one-dot commands. DISKIO instantly became our in-house utility and generated a great deal of appreciative mail. But when DOS 2.5 appeared, it became evident that DISKIO needed an update since it didn't work with the new DOS.*

*Antic contacted Dr. Oppenheim, who is a nuclear medicine physician. Though he was unable to find time in his busy schedule to rewrite the program, he generously sent us his source code which we immediately passed on to Patrick Dell'Era. Patrick—who will be remembered for his Antic enhancements of Price's Painter (April 1985) and Fader (May 1985)—set to work and created the following, incredible DISKIO PLUS. Yes,*

*it works with DOS 2.5. But a lot of new bells and whistles have been added. —ANTIC ED)*



okay, throw out your DUP.SYS. You're not going to need it anymore. DISKIO PLUS will take care of just about any disk function you can think of. And you won't have to go to DOS to do it.

## THREE LISTINGS

Before we get heavily into all the new things DISKIO PLUS can do, let's take care of those who already have DISKIO and just want to get it working with DOS 2.5.

Type in Listing 3, DSKIOFIX.BAS, check it with TYPO II, and SAVE a copy before you RUN it. This short BASIC program will alter a few bytes in your original DISKIO AUTORUN.SYS file and make it work with DOS 2.5 as well as DOS 2. If you're happy with DISKIO as is, you can stop reading right here. But if you want the full package of extras—like multiple file moves, wild cards, macros, BASIC XL/XE and MAC/65 compatibility—read on.

Still with us? Listing 1, DSKIOMAK.BAS, creates DISKIO PLUS. It's a lot of typing, but worth it. Type it in *very* carefully, check it with TYPO II and SAVE a copy. All that data is machine language and every number must be absolutely correct.

When you RUN Listing 1, it will count the data statements to make sure you have the right total. Then it will ask you to specify a filename. If you're using Atari DOS,

call your file AUTORUN.SYS. DOS XL users should name theirs STARTUP.EXC.

Next you're asked if you want your DISKIO PLUS for BASIC or assembly language. Choose your favorite language and the program will create a binary file of 30 sectors. (That's right, it's a little longer than the original. DISKIO eats 3129 bytes of RAM while DISKIO PLUS gobbles 3408.)

Listing 2, KEYMAC.BAS, is a special utility which will be described later. You don't need to type it in to make DISKIO PLUS work.

Antic Disk subscribers will find all three of the above listings on their monthly disk, under the filenames previously mentioned.

## DOT COMMANDS

There are a lot of options and commands with DISKIO PLUS. Maybe a little scenario will clarify things.

You decide to do a bit of programming in BASIC, so you boot your disk containing DISKIO PLUS in the form of an AUTORUN.SYS file. (Note: the assembly-language version of DISKIO PLUS operates identically to the BASIC version with the exception of using the [#] for file access).

A brief title screen appears to let you know DISKIO PLUS is installed, then the READY prompt pops into place.

You want to see what files are on the disk, so you type **DIR** [RETURN], and the DIRectory of drive 1 appears with all the files in alphabetical order, looking something like this:

```
1  AUTORUN  SYS  030      5  MYMAC      KEY  001
2  BIFFIII  BAS  057      6  RAMDISK  COM  009
3  DOS      SYS  074      7  SAMPLE   BAS  014
4  DUP      SYS  042      8  WORDTREEOBJ 001
479 FREE SECTORS
```

Notice the numbers immediately before each file. These are "file reference numbers" and are used by the DISKIO PLUS "one-dot" commands.

What's a one-dot command? Let's say you have decided to delete the file called SAMPLE.BAS. Since it has a reference number of 7, you type: **.D7**. A prompt will appear to make sure you really want to do this. Answer the prompt by pressing [Y], and the file will be deleted.

Want to LOAD a file? Type **.L2**. You can rename a file by typing:

**.N2,NEWFILE** [RETURN].

How about moving a file from drive 1 to drive 2? Type **.M6/2**. And for you jaded DISKIO users who have seen most of this stuff, how about wild-card *multiple* file moves? Type **.M\*.\* /2** to move all files from drive 1 to drive 2.

And—oh yes—that BASIC program you LOADED is still in memory—untouched and ready to examine.

## COMMAND STRUCTURE

At first there may seem to be a lot of combinations here. But once you get used to the structure of DISKIO PLUS commands, you'll find them to be automatic, natural, and

very fast. In most cases, the commands use an identical pattern with only one different letter to differentiate the command.

Let's examine all the possibilities with only one command; the command to lock (protect) a file:

**.K [n] [filename] [device:filename]**

The first, and most important, character is the period—or dot. This tells the computer that a DISKIO PLUS command is coming. Next is the letter signifying the type of command—in this case K, for lock.

The square brackets indicate optional parameters. They are *not* part of the DISKIO PLUS command.

You can reference the file you wish to lock in three ways. The first optional parameter is n, which stands for file reference number. If the directory is showing on the screen, you may use the file reference number as: **.K4**. This will lock file number four. Remember, the directory must be on the screen in order to use file reference numbers.

The second set of brackets shows we may alternatively type in the filename: **.KMYFILE.BAS**. Notice there is no space between the command letter and the file name.

Should we wish to lock a file in a drive other than the default drive, we can also use the device:

**.KD2:MYFILE.BAS**.

This example will lock MYFILE.BAS on the second drive.

Wild cards [\*] may be used with the second and third options. You can lock all the files by typing **.K\*.\***.

## HELP

All of the DISKIO PLUS dot commands work the same as lock, with the exception of some which have a few extra possibilities. If you forget a particular command, type **HELP** and the following menu will appear:

|                  |           |
|------------------|-----------|
| .N = RENAME      | .M = MOVE |
| .D = DELETE      | FORMAT    |
| .K = LOCK        | DIR       |
| .U = UNLOCK      | OFF       |
| .X = LIST        | .ON       |
| .S = SAVE        | LIST      |
| .E = ENTER       | WDOS      |
| .L = LOAD        | DEF1      |
| .R = RUN         | DEF2      |
| .B = BINARY LOAD | DEF3      |

Let's go through the commands one by one.

## DIRECTORY

Notice there are two types of commands—one-dot commands and "word" commands. The most used word command is **DIR**.

continued on page 65

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| Science: Grades 7/8 (D) ..... | \$16                          | Dallas Quest (D) .....          | \$19                        | <b>HAYDEN</b>                 |                         | Flight Simulator (D) .....     | Call                      | Oil's Well (D) .....         | \$12                    | Operation Market              |      |
| U.S. Geography (D) .....      | \$16                          | Elevator Action (D) .....       | \$19                        | Great Maine Race (D) .....    | \$19                    | Air Rescue 1 (D) .....         | \$21                      | Ultima I (D) .....           | \$23                    | Garden (D) .....              | \$33 |
| U.S. History (D) .....        | \$16                          | Letter Wizard w/Spell           |                             | Sargon II (D) .....           | \$16                    | Crusade in Europe (D) .....    | \$25                      | Ultima II (D) .....          | \$39                    | Qwestron (D) .....            | \$33 |
| World Geography (D) .....     | \$16                          | Checker (D) .....               | \$39                        | Sargon III (D) .....          | \$33                    | Decision in Desert (D) .....   | \$25                      | Ulysses (D) .....            | \$21                    | Panzer Grenadier (D) .....    | \$26 |

|                              |      |
|------------------------------|------|
| <b>ARTWORX</b>               |      |
| Bridge 4.0 (D) . . . . .     | \$16 |
| French (D) . . . . .         | \$19 |
| German (D) . . . . .         | \$19 |
| Monkeymath (D) . . . . .     | \$16 |
| Spanish (D) . . . . .        | \$19 |
| Strip Poker (D) . . . . .    | \$21 |
| Female Data Disk 1 . . . . . | \$16 |
| Male Data Disk 2 . . . . .   | \$16 |
| Female Data Disk 3 . . . . . | \$16 |

|  |      |
|--|------|
| <b>AVALON HILL</b>                       |      |
| Combat Chess (D) . . . . .               | \$19 |
| Computer Stocks<br>& Bonds (D) . . . . . | \$19 |
| Computer Title Bout (D) . . . . .        | \$21 |
| Gulf Strike (D) . . . . .                | \$21 |
| Jupiter Mission 1999 (D) . . . . .       | \$33 |
| Legionnaire (D) . . . . .                | \$21 |
| Maxwell Manor (D) . . . . .              | \$19 |
| Panzer Jagd (D) . . . . .                | \$21 |
| Quest of the                             |      |

|                              |      |
|------------------------------|------|
| Space Beagle (D) . . . . .   | \$23 |
| T A.C. (D) . . . . .         | \$26 |
| Telenguard (D) . . . . .     | \$21 |
| <b>BATTERIES INCLUDED</b>    |      |
| B-Graph (D) . . . . .        | Call |
| Home Pak (D) . . . . .       | \$33 |
| Paperclip (D) . . . . .      | \$39 |
| <b>BIG FIVE</b>              |      |
| Bounty Bob (R) . . . . .     | \$29 |
| <b>BRODERBUND</b>            |      |
| Bank St Writer (D) . . . . . | \$33 |
| Championship                 |      |

## Now Available for the Atari 520ST

|                                |      |                           |                                 |      |                               |      |
|--------------------------------|------|---------------------------|---------------------------------|------|-------------------------------|------|
| Mr. Do (D) .....               | \$16 | HBJ                       | F-15 Strike Eagle (D) .....     | \$23 | Wizard & Princess (D) .....   | \$19 |
| Pac Man (D) .....              | \$16 | Computer SAT (D) .....    | Gun Ship: The Helicopter        |      | <b>SPINNAKER</b>              |      |
| Pole Position 2 (D) .....      | \$19 | <b>INFOCOM</b>            | Simulation (D) .....            | Call | Adventure Creator (R) .....   | \$17 |
| The Goonies .....              | \$19 | Deadline (D) .....        | Kennedy Approach (D) .....      | \$23 | Aerobics (D) .....            | \$23 |
| Zorro (D) .....                | \$19 | Enchanter (D) .....       | Mig Alley Ace (D) .....         | \$23 | Alphabet Zoo (R) .....        | \$17 |
| <b>DAVIDSON</b>                |      | Infidel (D) .....         | Silent Service: The Submarine   |      | Delta Drawing (R) .....       | \$17 |
| Math Blaster (D) .....         | \$33 | Hitchhiker's Guide        | Simulation (D) .....            | Call | Facemaker (R) .....           | \$17 |
| Word Attack (D) .....          | \$33 | to the Galaxy (D)         | Solo Flight (D) .....           | \$21 | Fraction Fever (R) .....      | \$17 |
| <b>DESIGNWARE</b>              |      | Planetfall (D) .....      | <b>MINDSCAPE</b>                |      | Kids on Keys (R) .....        | \$17 |
| All Titles Available .....     | Call | Seastalker (D) .....      | Bank St. Music Writer (D) ..... | \$26 | Kindercomp (R) .....          | \$17 |
| <b>ELECTRONIC ARTS</b>         |      | Sorcerer (D) .....        | Crossword Magic (D) .....       | Call | Math Busters (D) .....        | \$19 |
| Archeon (D) .....              | \$19 | Starcross (D) .....       | Halley Project—                 |      | Rock 'N' Rhythm (D) .....     | \$19 |
| Archeon II (D) .....           | \$19 | Suspect (D) .....         | A Mission in Our                |      | Snooper Troops                |      |
| Hard Hat Mack (D) .....        | \$19 | Suspended (D) .....       | Solar System (D) .....          | \$26 | 1 or 2 (D) .....              | \$19 |
| Movie Maker (D) .....          | \$19 | Wishbringer (D) .....     | Tink's Adventure (D) .....      | \$19 | Story Machine (R) .....       | \$17 |
| Murder Zindernuef (D) .....    | \$19 | Witness (D) .....         | Tink's Subt. Fair (D) .....     | \$19 | Trains (D) .....              | \$19 |
| Music Const. Set (D) .....     | \$19 | Zork I (D) .....          | Tonk in the Land of             |      | <b>SPRINGBOARD</b>            |      |
| One-on-One (D) .....           | \$19 | Zork II or III (D) .....  | Buddy-Bots (D) .....            | \$19 | Early Games (D) .....         | \$23 |
| Pinball Construction           |      | * All titles in stock for | Tuk Goes to Town (D) .....      | \$19 | Fraction Factory (D) .....    | \$19 |
| Set (D) .....                  | \$19 | 520 ST—Call for prices    | <b>MUSE</b>                     |      | Make A Match (D) .....        | \$19 |
| Realm of                       |      | <b>LJK</b>                | Beyond Wolfenstein (D) .....    | \$23 | Music Maestro (D) .....       | \$23 |
| Impossibility (D) .....        | \$39 | Data Perfect (D) .....    | Castle Wolfenstein (D) .....    | \$19 | Piece of Cake Math (D) .....  | \$23 |
| Seven Cities of Gold (D) ..... | \$39 | Letter Perfect (D) .....  | <b>OSS</b>                      |      | SSI                           |      |
| <b>Prices too low to</b>       |      | Spell Perfect (D) .....   | Action (R) .....                | \$49 | Battalion Commander (D) ..... | \$26 |
| <b>advertise!! .....</b>       | Call | <b>LEARNING COMPANY</b>   | Action Tool Kit (D) .....       | \$19 | Battle Normandy (D) .....     | \$25 |
|                                |      | Bumble Games (D) .....    | Basic XE (R) .....              | \$49 | Breakthrough in the           |      |
|                                |      | Colorasaurus (D) .....    | Basic XL (R) .....              | \$39 | Ardenes (D) .....             | \$39 |
|                                |      | Magic Spells (D) .....    | Basic XL Tool Kit (D) .....     | \$19 | Broadsides (D) .....          | \$25 |
|                                |      | Ballblazer (D) .....      |                                 |      |                               |      |

P.O. BOX 278—DEPT. AT—WILDWOOD, PA 15091

\*Ordering and Terms: Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. Shipping: Continental U.S.A.—Orders under \$100 add \$3; free shipping on orders over \$100. PA residents add 6% sales tax. AK, HI, FPO-APO—add \$5 on all orders. Sorry—no International orders. Defective merchandise will be replaced with same merchandise. Other returns subject to a 15% restocking charge—NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice.

**Extended Holiday Hours**  
 Nov. 11-Dec. 16  
 M-Th 8:30 AM - 9 PM EST  
 Fri-Sat  
 8:30 AM - 6 PM EST  
 Christmas Order  
 Deadline—Dec. 17

FOURTH ANNUAL ANTIC

# SHOPPERS

# guide

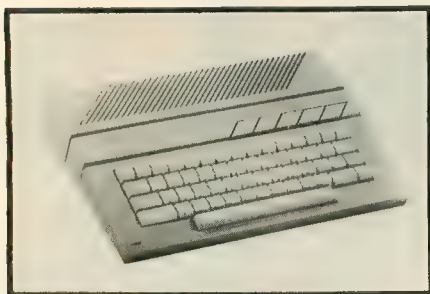
**T**his has been a year of exciting changes in the Atari marketplace. Here's **Antic's** selection of over 100 best products—of every type—available for Atari computers during the 1985 holiday season.

by GIGI BISSON  
**Antic** Assistant Editor  
with  
NAT FRIEDLAND  
and  
JACK POWELL  
of the **Antic** Staff

*In certain widespread categories, such as printers, modems and video monitors, so many makes and models are compatible with the Atari that we cannot possibly test every product on the market. The **Antic** picks in these categories are the best of these products with which we have had first-hand experience.*

# HARDWARE

## 8-bit COMPUTERS



### ATARI 130XE

The 130XE showed up in stores this spring without any fanfare. It has been selling fast—at prices as low as \$119.97—and customers are more than satisfied. With twice as much memory as the 800XL, this 128K computer is capable of running “serious” productivity software without any compromise.

Yet the 130XE is totally upward-compatible with all the rest of Atari’s 8-bit computers (no other company has ever maintained such compatibility) and the sleek new keyboard is a joy to operate. A computer this good, selling for less than what the 800XL cost in 1984, would have been simply unimaginable 18 months ago.

\$149.95



### ATARI 800XL

It’s hard to believe that the 800XL—along with the legendary 800 the best 64K personal computer ever made—is now selling for less than \$100 and no longer is in production. If Atari continues to market a low-priced 64K computer in the U.S., it will be same 65XE model which is available in Canada and overseas. However, the

800XL is still a fine choice for first-time computer buyers in 1985, with its solid base of good software and self-teaching books.

\$99.95

## 16-bit COMPUTERS

### ATARI 520ST

Here is the future of Atari. The 520ST arrived in July with 512K memory, a 360K, 3 1/2-inch disk drive, a color monitor, a two-button mouse and the GEM icon-driven operating interface, and a choice



between 640x400 monochrome monitor or a 512-color RGB monitor. This computer package costs *less* than a stripped-down 64K Apple IIe.

There has never been a personal computer as powerful as the 520ST available at anywhere near the below-\$1,000 price. The ST series is driven by the same Motorola 68000 microchip used in the Macintosh, the high-powered 68000 runs on the ST at a speed of 8Mhz (eight million cycles per second). The ST’s built-in interfaces include RS-232 serial, Centronics parallel, MIDI and three types of video input. The keyboard is controlled by its own microprocessor and includes a 10-key pad, one-touch cursor section, 10 programmable function keys and an UNDO key.

\$799.95 with monochrome monitor  
\$999.95 with color monitor

### 260STM, 260TFM

At this writing, Atari says it is still planning an October release of the 260ST model announced at the June Consumer

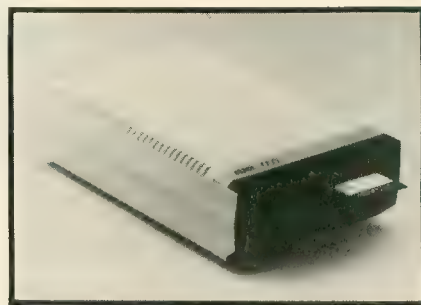
Electronics Show. The 260STM (\$399.95) was to have 256K memory. It would sell without a monitor, and a television RF modulator would be built-in. GEM would be in memory-conserving ROM chips instead of on disk. (Atari has promised that 520ST owners will be able to obtain the finalized GEM on simple plug-in chips at “nominal cost.”) A 260TFM model was to include a built-in 3 1/2-inch disk drive and sell for \$499.95.

Atari Corporation, 1196 Borregas Avenue, Sunnyvale, CA 94086 (408) 745-2000

(Model numbers and prices of Atari Corp. products described in this Shoppers Guide may be subject to change.)

**See the ST SECTION in this issue for the Shoppers Guide to ST Peripherals and Software.**

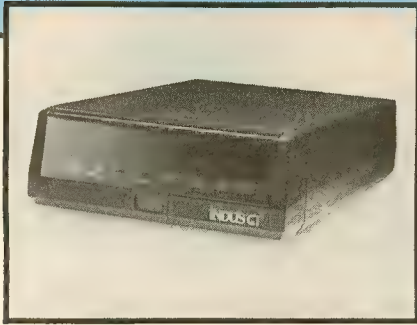
## disk drives



### ATARI 1050

This dependable “no frills” drive simply reads and writes disks, with no digital readouts, no printer ports, no on-board bells and whistles. But it is a proven reliable performer that does the job well, supports single and enhanced density and is immediately compatible with all Atari software. Comes with well-programmed DOS 2.5 disk operating system.

\$199.95. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

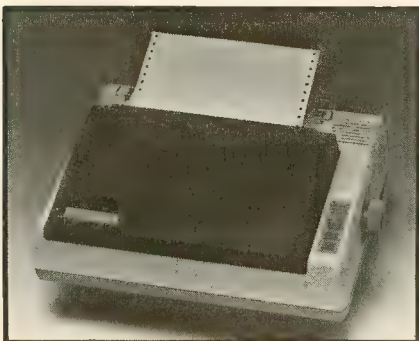


### INDUS GT

Indus has reduced the price of the "Mercedes" of Atari drives. This reliable disk drive has a sexy, high-tech look and has been recently enhanced with Syncromesh, a DOS that runs it faster than ever. The front panel flaunts a flashing digital display and four control buttons. Whisper quiet, the Indus supports single, enhanced and double density and comes in a compact carrying case that converts to a disk library. You also get software including DOS XL, a simple word processor and a spreadsheet.

\$324.95. Indus Systems, 9304 Deering Avenue, Chatsworth, CA 91311. (818) 882-9600.

## PRINTERS

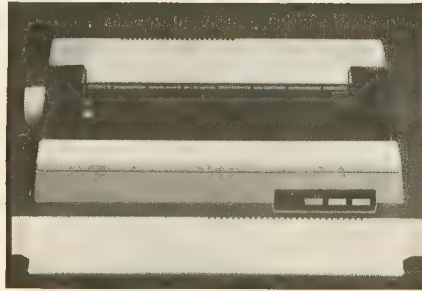


### STAR SG-10

Offering both speedy draft quality and great-looking "near letter quality," the SG-10 dot-matrix printer is a worthy successor to Star's deservedly popular Gemini 10X. Antic has successfully used the SG-10 with AtariWriter, PaperClip, HomePak, Letter Perfect, Print Shop, and every program from our March 1985 Printer Issue. We also use the "near letter quality" mode to prepare all the program listings in the

magazine. Sold for much less than the list price at many outlets. Interface required.

\$299.99. Star Micronics, Inc. 200 Park Avenue, New York, NY 10166. (212) 986-6770.



### EPSON DX-10

Don't let the low price fool you. Epson's first daisy wheel printer offers true letter-quality for the masses. It's no speed demon at 10 characters per second and it doesn't come with a tractor feed. But the DX-10 is a real value breakthrough with excellent type quality and costly features like boldface, underlining, superscript, subscript and easily changed cartridge ribbon. Interface required.

\$299. Epson America, Inc., 2780 Lomita Boulevard, Torrance, CA 90505. (213) 539-9140.

### C. ITOH 8510 SEP+

A fast dot-matrix printer that's built like a tank, for years of heavy business or academic use. The "near letter quality" type is bold and clear—about what you'd get on a manual typewriter with a cloth ribbon. Speedy 180 cps at draft mode, full ASCII character set with true descenders, subscript, superscript, underlining, friction and tractor feed. Interface required.

\$549. C. Itoh Digital Products, Inc., 1011 Francisco Street, Torrance, CA 90502. (213) 327-5939.

### ATARI XDM121, ATARI XMM801

As *Antic* went to press, Atari told us that two new printers for the 8-bit computer line would arrive in October. The \$229.95 letter quality XDM121 is a daisy wheel printer. The \$199.95 XMM804 dot-matrix model supports graphics and prints 80

characters per second. Either model uses the Atari's regular SIO connectors and will daisychain with disk drives.

Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

## COLOR PRINTERS

### OKIMATE 10

The Okimate 10 is a small, quiet and inexpensive thermal printer that prints 8" x 5 1/4" color images on single sheet or tractor feed paper. It comes with a slow, poorly designed BASIC program that will make color printouts from most Micro Illustrator files, if you have an XL/XE computer with 48K memory and DOS 2.



However, the way to get truly impressive color printouts from the Oki is to use **RAMbrandt** software (\$19.95, Antic Catalog, AP157) and coated ink-jet paper.

\$208 including Atari interface. Okidata Corp., 532 Fellowship Road, Mt. Laurel, NJ 08054. (609) 235-2600.

## MONITORS

### COMMODORE 1702

Yes, it's a first. You are actually seeing *Antic* Magazine recommend a product from Atari's arch-rival. Until arrival of Atari's long-promised line of \$150 monitors, the popular Commodore 1702 may

continued on page 33



# MTS SOFTWARE GAZETTE



VOL.1 NO.1 **MTS INTRODUCES THEIR HI-RES GRAPHICS SERIES!** WINTER 1985

## ARTIST UNLEASHED

This is the first program in MTS's new Hi-Res Graphics Series. With it you can create graphics or write text anywhere on the graphics 8 screen.

### Features:

- \* Enlarge/Reduce \* Move \* Copy
- \* Merge \* Rotate \* Reverse \* Invert
- \* Inverse Video \* Turn upside down
- \* Save any section of screen \* Erase
- \* Print out 3 Sizes \* Change colors

The program also includes:

- \* **REFINE** - lets you blow up images so you can refine them.

- \* **SHOW** - lets you see what is on your data disk and view the graphics.

### \* CHARACTER GENERATORS:

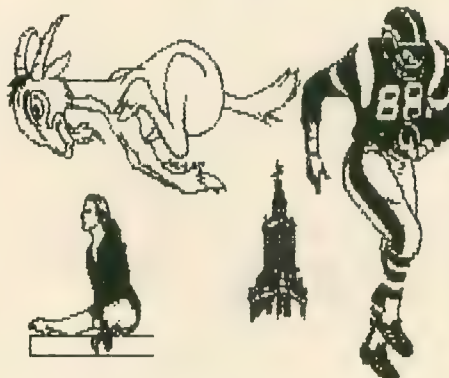
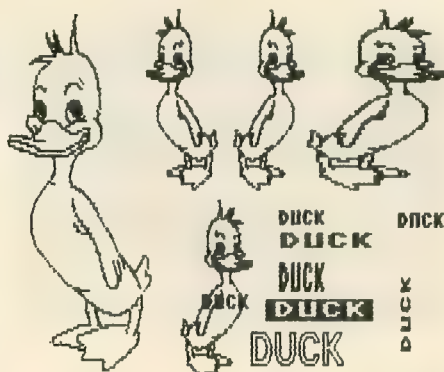
**REGULAR SIZE** - lets you create your own character set. *Scatzi*

**DOUBLE SIZE** - lets you create double size character set.

## SHADOW BLOCK CLOSED

ICONS:     

PATTERNS:      



## 80 COLUMN DISPLAY WORD PROCESSOR NOW AVAILABLE

MTS Software's **WRITE 80**, an 80 column display, full-featured word processor is now available. No additional hardware is required. It works with a TV or monitor. Printer codes can now be inserted.

It has features such as block move, overwrite, help screen, justification, automatic centering, etc.

## SUPPORT PROGRAM FOR WRITE 80

MTS's **PRINT PLUS** is an Epson printer utility program for **WRITE 80**. It lets you design your own character sets for the computer and the printer. Using the character sets you create or some that are provided, you can print out your text from **WRITE 80** on the Epson printer.

**coming soon!**

## CARD

CREATE YOUR OWN GREETING CARDS USING ANY COMBINATION OF TEXT, GRAPHICS AND BORDERS ON ALL 4 PAGES. UTILIZES FEATURES SIMILAR TO ARTIST UNLEASHED.

## LAYOUT

COMBINE 2,3 OR 4 COLUMNS AND HEADLINES OF UNRESTRICTED TEXT AND GRAPHICS TO CREATE NEWS PAGES, POSTERS, LEAFLETS, ADS, LETTERHEADS, ETC.

NOTE: THIS ENTIRE AD WAS CREATED USING MTS'S LAYOUT PROGRAM.



## DATA DISKS

GRAPHICS, FONT SETS AND BORDERS USABLE ON ALL HI-RES GRAPHICS SERIES PROGRAMS

## BIG PICTURE

USES 9 HI-RES GRAPHICS SCREENS TO MAKE A 960X480 RESOLUTION PRINT OUT. POSITION TEXT AND GRAPHICS ANYWHERE WITHIN THE 9 SCREEN COMPOSITE. UTILIZES FEATURES SIMILAR TO ARTIST UNLEASHED.

7.5 INCH WIDE BY 6.5 INCH HIGH PRINTED OUTPUT.

## Dealer Inquiries Invited

**WRITE 80** .....59.95  
**PRINT PLUS**.....29.95  
**\*ARTIST UNLEASHED**.....49.95  
**\*CARD**.....39.95  
**\*LAYOUT**.....39.95

\*ALL GRAPHICS PROGRAMS AVAILABLE ONLY FOR EPSON OR COMPATIBLE PRINTERS AT THIS TIME.

## SEE YOUR DEALER

Call or write for more information  
 For direct orders enclose the amount plus \$3 for shipping. Specify UPS or first class mail delivery  
 NY State residents add 8% sales tax

Order Line  
 716-634-0578

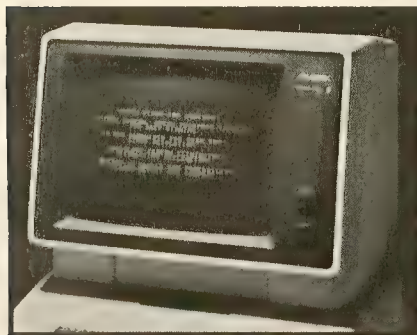
MTS Software  
 P.O. Box 623  
 Williamsville, NY 14221

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# HARDWARE

well be the best deal around for color/sound video. The big plus here is the sharp color image provided by the 1702's separate chrominance and luminance output, which will also go great with your VCR. Standard video output is also provided.

\$225. Commodore Computer, 1200 Wilson Drive, West Chester, PA 19380. (800) 247-9000.



## AMDEK 300A

This amber monochrome monitor makes for easy reading, especially when doing a lot of word processing or database entry. We use this here at Antic with an Atari 800 computer and our busiest letter-quality printer. It does the job well.

\$199. Amdek, 2201 Lively Boulevard, Elk Grove Village, IL 60007. (312) 364-1180.

## NEC 1215

This color monitor offers clear, crisp hues with equally good sound. You can adjust brightness, color, tint, volume and sharpness. At Antic it's a favorite for game-playing. Note: Color monitors cannot support 80-column screens, most desirable for word processing. (Not that it's easy to find an 80-column enhancement for Atari today.)

\$399. NEC Home Electronics, 1401 Estes Avenue, Elk Grove Village, IL 60007. (312) 228-5900.

## UNIQUE

### U.S. DOUBLER

A simple hardware modification for your 1050 disk drive that gives you true dou-

ble density. Supports the ultra-fast I/O features of SpartaDOS disk operating system.

\$69.95 including SpartaDOS. ICD Inc., 1220 Rock Street, Suite 310, Rockford, IL 61101. (815) 229-2999.

## OMNIMON

Unravel the secrets of top programmers. This easy hardware modification provides a resident machine language monitor and lets you examine commercial programs in memory while they run.

\$69.95. CDY Consulting, 421 Hanbee, Richardson, TX, 75080. (214) 235-2146.

## PROBURNER

This professional-quality EPROM burner is a cartridge that plugs right into your Atari and programs chips from its own built-in socket. It can be used to program a wide variety of EPROM and EEPROM types. And it's easier to use than any other burner made for the Atari.

\$149, 32K cartridge. Thompson Electronics, 7 Jackes Avenue, Suite 502, Toronto, Ontario M4T 1E3, Canada. (416) 960-1089.

## C.E.A. HOME CONTROL

If you want to use your Atari to regulate a home appliance control system, the C.E.A. hardware-software package uses a joystick port interface to start or stop as many as four devices. A heater/ac temperature controller is included, and the BASIC software is reprogrammable.

\$89.95, 48K disk. Computer Engineering Applications, P.O. Box 4878, Las Vegas NV 89127.

## COMPETITION PRO 5000

Designed to bring an "arcade feel" to the Atari, the Model 5000 joystick features a microswitch assembly for greater accuracy and higher scores. Comes with a five-foot cord and unconditional two-year warranty.

\$17.95. Competition Pro, 2609 Greenleaf Avenue, Elk Grove, IL 60007. (312) 228-1810.



## COMPUTEREYES

As soon as a review copy of this slow-scan video acquisition system arrived at Antic, we set up a video camera and started digitizing pictures of everyone who would sit still long enough. Then we printed out the images with **Print Shop**, tinted, retouched and defaced them with touch tablets, and even sent them out on **CompuServe**. You can also capture images from videotape recorder, video disk or live TV. Includes interface module and software on disk. For \$399.95, the package includes a basic black & white video-camera.

\$129.95, 48K disk. Digital Vision, Inc., 14 Oak Street, Suite 2, Needham, MA 02192. (617) 444-0940.

## S.A.M.

### (Software Automatic Mouth)

S.A.M. is a voice synthesizer on a disk that sounds just about as good as the much more expensive "black box" voicemakers. S.A.M. is fun, flexible, easy to use and has a good manual. You can add speech to your own BASIC and machine language programs. S.A.M. uses only 9K memory and works with all Atari computers.

\$59.95, 16K disk. Tronix, 8295 S. La Cienega Boulevard, Inglewood, CA 90301. (213) 215-0529.

## INTERFACES, buffers

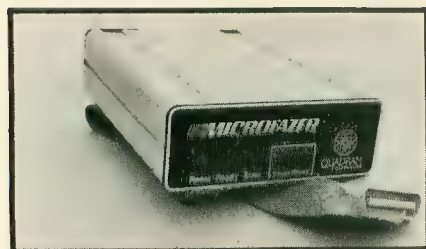
### ATARI 850

The Atari 850 Interface Module is a versatile tool that converts data from your computer into formats compatible with the RS-232 serial standard used by most modems, and also for the Centronics parallel standard used by most printers. It's not easy finding an 850 at your local computer

# HARDWARE

store. See August, 1985 **Antic** for a list of dealers.

\$87-\$160, depending on dealer. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.



## QUADRAM MICROFAZER

Quadram's Microfazer is a printer buffer that eliminates those frustrating pauses as you wait for your 25-page masterpiece to print. The Microfazer comes in different buffer sizes. Three are listed below. When choosing, figure on 2K per printed page.

\$179/8K, \$299/64K. Quadram Corporation, 4355 International Boulevard, Norcross, GA 30093. (404) 923-6666.

## INTERFAST-1

The Interfast-1 is a programmable printer interface with 4K RAM for use as a printer buffer or as storage for custom character sets. A software utilities disk is included to allow for downloading character sets into the Interfast-1 and using those character sets with your word processing program and graphics printer. It provides a

Centronics parallel interface. Used as a buffer, it stores about two text pages.

\$129.95. Advanced Interface Devices, PO Box 2188, Melbourne, FL 32901. (305) 242-2772.

# MODEMS

## ATARI 1030

What more can we say about the inexpensive and widely used 300 baud Atari 1030 modem? All you need is 16K and a telephone line—you can telecommunicate without even an interface or a disk drive. However, disk communications software is included, along with a free introductory subscription to CompuServe and Dow Jones Retrieval Service.

\$59.95. Add-On Systems, 524 Second Street, San Francisco, CA 94107.

## HAYES SMARTMODEM 1200/2400

Hayes is the industry standard. The Smartmodem 1200 (\$599) offers solid construction, direct connection, automatically adjusted baud rate, internal speaker, auto-answering and the best documentation around. You can use it with radioteletype, as a data line monitor, as a local network or you can configure internal DIP switches to suit your needs. The 2400 (\$899) offers all of these features plus 2400 baud, compatibility with Bell 103, 212A and

CCITT B.22 communication standards, auto answer, autodial, non-volatile memory, and is software controlled, so no external switches are needed.

Hayes Microcomputer Products, 5835 Peachtree Corner East, Norcross, GA 30092. (404) 449-8791.

## SIGNALMAN EXPRESS

Anchor Automation is replacing the MKXII, with the Express, a competitively priced (\$399), 99.9% Hayes compatible with more features for the same price. This direct-connect, multiple-baud modem has



autodial, auto answer, 18 programmable set registers, eight LED lights, eight dip switches, speaker with volume control and a memory chip that stores 10 phone numbers. You'll need an RS-232-to-DB cable (about \$22) to connect to the 850 interface. Two year warranty.

\$399. Anchor Automation, 6913 Valjean Avenue, Van Nuys, CA 91406. (818) 997-7758.

# ONLINE SERVICES

Hourly rates and membership fees for commercial online services are subject to change. Contact individual companies for latest information. You'll need a modem to hook up.

## COMPUSERVE

The leading online information service, CompuServe offers stock quotes, news, weather, airline reservations, games, recipes, shopping and special interest

groups on dozens of topics—including the ANTIC ONLINE edition and an active SIG\*Atari with hundreds of downloadable programs. Evening and weekend rates are \$6 per hour for 300 baud and \$7.75 for 1200 baud. \$40 entry fee. Highly addictive.

500 Arlington Center, Box 20212, Columbus, OH 43220. (800) 848-8199; in Ohio (614) 457-8600.

## DELPHI

Delphi offers news, electronic mail, and searchable databases. But it specializes in user-created files, which may be either public or private. Seek expert advice, confer in realtime with other users, and look for SIG\*Atari and ANTIC ONLINE too.

continued on page 36

# THE MOST CHALLENGING GAMES AT THE MOST REASONABLE PRICES

| SSI                       | LIST PRICE | OUR PRICE |
|---------------------------|------------|-----------|
| Battle for Normandy       | \$40       | \$27      |
| Breakthrough/Ardennes     | \$60       | \$40      |
| Broadsides                | \$40       | \$27      |
| Carrier Force             | \$60       | \$40      |
| Colonial Conquest         | \$40       | \$27      |
| Combat Leader             | \$40       | \$27      |
| Computer Ambush (2nd Ed.) | \$60       | \$40      |
| Computer Baseball         | \$40       | \$27      |
| Computer Quarterback      | \$40       | \$27      |
| The Cosmic Balance        | \$40       | \$27      |
| Cosmic Balance II         | \$40       | \$27      |
| Eagles                    | \$40       | \$27      |
| Field of Fire             | \$40       | \$27      |
| 50 Mission Crush          | \$40       | \$27      |
| Fortress                  | \$35       | \$23      |
| Galactic Adventures       | \$60       | \$40      |
| Gemstone Warrior          | \$35       | \$23      |
| Imperium Galactum         | \$40       | \$27      |
| Kampfgruppe               | \$60       | \$40      |
| Knights of the Desert     | \$40       | \$27      |
| Objective Kursk           | \$40       | \$27      |
| Operation Market Garden   | \$50       | \$33      |
| Phantasia                 | \$40       | \$27      |
| Questron                  | \$50       | \$33      |
| Rails West                | \$40       | \$27      |
| Reforger 88               | \$60       | \$40      |
| Ringside Seat             | \$40       | \$27      |
| Six Gun Shootout          | \$40       | \$27      |
| Tigers in the Snow        | \$40       | \$27      |
| War in Russia             | \$80       | \$53      |

| MICROPROSE                | LIST PRICE | OUR PRICE |
|---------------------------|------------|-----------|
| Crusade in Europe         | \$40       | \$27      |
| Decision in the Desert    | \$40       | \$27      |
| F-15                      | \$35       | \$24      |
| Hellcat Ace, Spitfire Ace | \$30       | \$20      |
| Kennedy Approach          | \$35       | \$24      |
| Mig Alley Ace             | \$35       | \$24      |
| Nato Commander            | \$35       | \$24      |
| Solo Flight               | \$35       | \$24      |

| ELECTRONIC ARTS          | LIST PRICE | OUR PRICE |
|--------------------------|------------|-----------|
| Archon                   | \$24       | \$16      |
| Archon II: Adept         | \$35       | \$23      |
| Cut & Paste              | \$24       | \$16      |
| Financial Cookbook       | \$40       | \$27      |
| M.U.L.E.                 | \$24       | \$16      |
| Murder on the Zinderneuf | \$24       | \$16      |
| Music Construction Set   | \$24       | \$16      |
| One on One               | \$35       | \$23      |
| Realm of Impossibility   | \$24       | \$16      |
| Seven Cities of Gold     | \$35       | \$23      |

| AVALON HILL               | LIST PRICE | OUR PRICE |
|---------------------------|------------|-----------|
| Clear for Action          | \$30       | \$20      |
| Combat Chess              | \$25       | \$17      |
| Gulf Strike               | \$30       | \$20      |
| Jupiter Mission 1999      | \$50       | \$33      |
| Legionnaire               | \$30       | \$20      |
| Maxwell Manor             | \$25       | \$17      |
| Panzer Jagd               | \$30       | \$20      |
| Quest of the Space Beagle | \$35       | \$23      |
| T.A.C.                    | \$40       | \$27      |
| Telengard                 | \$28       | \$19      |

| INFOCOM                  | LIST PRICE | OUR PRICE |
|--------------------------|------------|-----------|
| Cutthroats               | \$35       | \$24      |
| Deadline                 | \$45       | \$30      |
| Enchanter                | \$35       | \$24      |
| Hitchhikers Guide/Galaxy | \$35       | \$24      |
| Infidel                  | \$40       | \$27      |
| Planetfall               | \$35       | \$24      |
| Seastalker               | \$35       | \$24      |
| Sorcerer                 | \$40       | \$27      |
| Starcross                | \$45       | \$30      |
| Suspect                  | \$40       | \$27      |
| Suspended                | \$45       | \$30      |
| Wishbringer              | \$35       | \$24      |
| Witness                  | \$35       | \$24      |
| Zork I                   | \$35       | \$24      |
| Zork II, III             | \$40       | \$27      |
| Four-in-one-Sampler      | \$ 8       | \$ 6      |
| Invisiclus               | \$ 8       | \$ 6      |

| ETC.                  | LIST PRICE | OUR PRICE |
|-----------------------|------------|-----------|
| Chickamauga           | \$35       | \$25      |
| Flight Simulator II   | \$50       | \$36      |
| Micro League Baseball | \$40       | \$27      |
| Mindwheel             | \$40       | \$27      |
| Napoleon at Waterloo  | \$35       | \$25      |
| Operation Whirlwind   | \$40       | \$21      |
| Rome & the Barbarians | \$35       | \$25      |
| Ultima III            | \$60       | \$40      |
| Universe              | \$98.50    | \$70      |

Blank Disks—Bonus Disks SSDD \$12/box of 11

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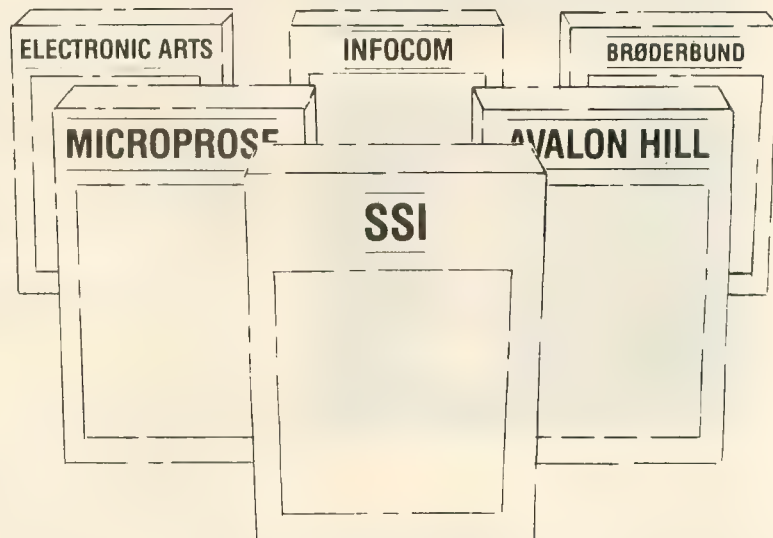
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# ONLINE SERVICES

Lifetime registration is regularly \$49.95, which includes two free evening hours. Evening and weekend rate is \$6 an hour for 300 or 1200 baud.

3 Blackstone Street, Cambridge, MA 02139. (800) 544-4005; in MA (617) 491-3393.

## THE SOURCE

Now this strong general-information online network also offers speedy 2400 baud premium service. Membership fee of

\$49.95 includes unlimited free time to learn the system in an online tutorial. Latest pricing is by the minute. Evening and weekend rates per minute are: 14 cents for 300 baud, 18 cents for 1200 baud and 20 cents for 2400 baud.

1616 Anderson Road, McLean, VA 22102. (703) 734-7500.

## GAMES COMPUTERS PLAY

Enter gameworld... log on and suddenly

you're in a wonderland of bold, state-of-the-art online color graphics. Your Atari's playmate is a powerful 300 megabyte minicomputer that offers spectacular interactive games, real-time conferencing, electronic mail and public domain downloads. Requires 48K disk drive, 1200 baud modem recommended. Evening and weekend rate is \$6 an hour.

112 East Market Street, York, PA 17401. (717) 848-2660.

# SOFTWARE

The software in this section runs on all 8-bit Atari computers, unless a required minimum memory size is specified in the entry. Software for the new 16-bit ST models is described in this issue's ST Section.

## Graphics



## RAMBRANDT

RAMbrandt produces spectacular color or monochrome images in five graphics modes. It has onscreen windowing, three text fonts, zoom, paint, animation, rubber stamp, 128 colors onscreen at once and many additional high-powered features. This is the only Atari graphics soft-

ware you can buy that is compatible with the inexpensive Okimate 10 color printer.

\$19.95, 48K disk. Antic Catalog, AP157.

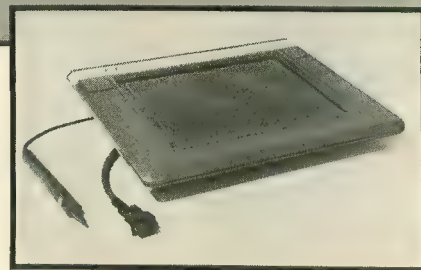
## MICRO-PAINTER

Micro-Painter is the original and best-known joystick drawing program for Atari, and it set a standard format for graphics files. It uses Graphics 7 1/2, a high resolution, four-color mode. The program's drawing tools include rubber band, fill and magnify. Just as Antic was going to press, we learned that the manufacturer was shutting its doors. So if you can't find Micro-Painter at a nearby store, PD Micropaint Artist is a public domain program (Antic Catalog, PD053) that does the same job.

\$34.95, 48K disk. DataSoft, 19808 Nordhoff Place, Chatsworth, CA 91311. (213) 701-5161.

## MICRO ILLUSTRATOR

You can't just go into the store and buy Micro Illustrator. This is the graphics software that comes with virtually all touch tablets and light pens made for the Atari. The easy-handling four-color drawing program features line, circle, mirror and fill modes—and offers many styles of "brushes" to draw with. Your finished pictures can be saved on disk in compacted form, or in standard MicroPainter format.



## ATARI TOUCH TABLET

The stylus has a built-in button controller and won't get lost because it's attached by cable to a sturdy tablet. This is the easiest tool for creating fine Atari graphics. But it can be tough to find. Runs powerful, easy-to-use Micro Illustrator software (under AtariArtist brandname) in a handy cartridge.

\$59.95, 32K cartridge. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

## KOALAPAD, KOALA LIGHT PEN

The KoalaPad's Atari version may be hard to find in stores this Christmas. But the manufacturer has assured us that the popular graphics tablet is still being manufactured and supported for the Atari. Available at the same price is the Koala Light Pen, which also uses Micro Illustrator on disk. Call Koala's toll-free number for your nearest dealer.

\$99.95 each, 48K disk. Koala Technologies, 2065 Junction Avenue, San Jose, CA 95131. (800) KOA-BEAR.

# SOFTWARE

## GAMES



### BALLBLAZER, RESCUE ON FRACTALUS

The long-awaited Lucasfilm arcade games are everything you would expect in the "Star Wars" tradition. Ballblazer puts you at the controls of a hovercraft-like Rotofoil in the year 3097 as you participate in a futuristic soccer bout. Rescue on Fractalus puts you in the cockpit of a Valkyrie Fighter cruising at mach 7.2. This space-age flight simulator takes you over detailed fractal landscapes and offers 16 levels of play. From the exquisite animation while the games are loading, to the music and the challenging action—these games define state-of-the-art.

\$40 each, 48K disk. Epyx, Inc., 1043 Kiel Court, Sunnyvale, CA 94089. (408) 745-0700.



### M.U.L.E.

Colonize a planet with the "aid" of the balky Multiple Use Labor Element robots. Food and minerals are quite limited. So, do you cooperate with the other players

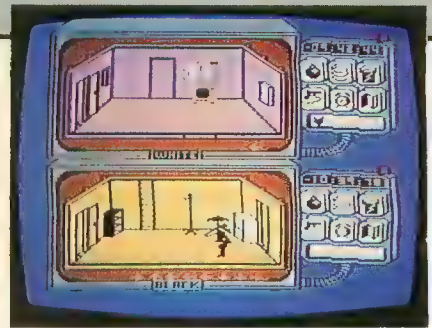
(up to four) or do you double-cross them?

\$22.95, 48K disk. Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171.

### ODESTA CHESS

The better microcomputer chess programs, like this one, are currently competitive with even some mainframe programs—and certainly play chess well beyond the skill of most non-pro humans. Larry Atkin, who programmed Odesta Chess, also helped write the groundbreaking CHESS program at Northwestern University.

\$69.95, 48K disk. Odesta Corp., 4084 Commercial Avenue, Northbrook, IL 60062. (312) 498-5615.



### SPY VS. SPY

Cartoonist Antonio Prohias' black and white peak-capped secret agents have been double-crossing each other in Mad Magazine since 1960. You and your opponent leave traps for each other—bombs, electrified water, guns with strings attached to the trigger—and rely on an arsenal of remedies. Brings out the sadist in you!

\$29.95, 48K disk. First Star Software, 18 E. 41 Street, New York, NY, 10017. (212) 532-4666.

## GAME SOFTWARE YOU CAN TRUST

You could walk into a store blindfolded and buy almost any Atari title from these publishers with the confidence that you now own a highly enjoyable game or application. Most of these products require 48K memory and a disk drive. Prices range from \$19 to \$60.

### Text Adventures: INFOCOM

Infocom is almost synonymous with critically acclaimed, slickly packaged interactive text adventure games. Like paperback novels, they come in genres such as science fiction, fantasy, detective mysteries and Indiana Jones-ish thrillers. Unlike paperback novels, the lead character is *you*.

Many Infocom games are packaged with goodies like maps, lab reports, journals, hieroglyphic stone rubbings and truly hilarious manuals. Our favorites are the pure fantasy worlds (**Zork**, **Enchanter**, **Sorcerer**) and anything written by Steven Zeretsky (**Planetfall**). This year's biggest hit was **Hitchhiker's Guide to the Galaxy**, based on the eccentric Douglas Adams novel.

Infocom, Inc. 55 Wheeler Street, Cambridge, MA 02138. (617) 492-1031.

### Strategy War Games: STRATEGIC SIMULATIONS INC.

In these historically accurate, complex military simulations, you can wear the shoes of Napoleon, Eisenhower and other fabled commanders as you lead your nation to battle.

Some of the SSI titles we reviewed enthusiastically this year are **Computer Ambush**, **Reforger '88**, **Kampfgruppe** and **Broadsides**. Classic introductions to the genre include **Field of Fire** and **Eagles**.

Strategic Simulations, Inc., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043. (415) 946-1200.

### BRODERBUND/SYNAPSE

In 1985, one of the most successful publishers of game and applications software joined forces with another outstanding publisher that specialized in Atari software. Now, you can't miss with almost *any* Atari title from Broderbund or Synapse.

For proof, try the addictive ladder action of **Loderunner** or **Pharaoh's Curse**, the high-flying excitement of **Choplifter** or **Blue Max 2001**.

Broderbund/Synapse. 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

# SOFTWARE

## LIFESPAN

Lifespan is a surrealistic collection of five games that takes you on a kaleidoscopic journey through human existence—and gives you much to think about afterwards. Programmer John O'Neill has been called "the Salvador Dali of computer games."

\$17.95, 48K disk. Antic Catalog, LS100.



## GREAT CROSS COUNTRY ROAD RACE

This is the Ferrari Dino of race games. It's got variety, clever illusions, great sounds and scenery. None of that crash-and-burn mentality here. In this game, your opponent is time—and you'll spend lots of it losing yourself in one of the best releases of the year.

\$24.95, 48K disk. Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043. (415) 960-0410.



## FLIGHT SIMULATOR II

The most advanced flight simulation program available for the Atari puts you in the pilot's seat of a Piper Cherokee Archer. Features color scenery of Chicago, New York, Seattle and Los Angeles, and 80

usable airports. Remember, this is a sophisticated training program that requires learning very precise and detailed operating instructions.

\$49.95, 48K disk. Sublogic Corporation, 713 Edgebrook Drive, Champaign, IL 61820. (217) 359-8482.

## TRIVIA QUEST

The big difference between this game and others of the genre is that it incorporates trivia questions into a race around a game board (a la Trivial Pursuit.) It's also the first trivia game to utilize the graphic and scrolling capabilities of the Atari with first-rate graphics and animation.

\$39.95, 48K disk. Royal Software, 2160 W. 11th Avenue, Eugene, OR 97402. (503) 683-5361.



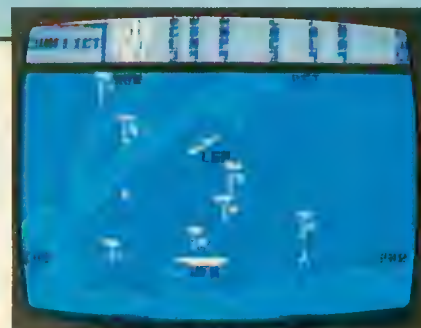
## F-15 STRIKE EAGLE

Your first mission sends you to Libya to bomb military airfields. Launch into aerial combat with this almost too realistic joystick-controlled computerization of seven sky battlezones over the Mid-East and Viet Nam. You get state-of-the-art weapons systems, computerized radar, eight supersonic guided missiles, 18 bombs and a 20 mm cannon with 1,000 rounds of ammunition.

\$34.95, 48K disk. MicroProse Software, 120 Lakefront Drive, Hunt Valley, MD 21030. (301) 667-1151.

## KENNEDY APPROACH

Strap on your headset and pop a few No-Doz tablets—you'll be glad when this shift is over. This exciting air traffic controller simulation even includes computer-generated speech. Rescue passengers from



emergencies, and control 20 different aircraft coming in from all directions to land at the nation's busiest airports.

\$34.95, 48K disk. Microprose Software, 120 Lakefront Drive, Hunt Valley, MD 21030. (301) 667-1151.

# EDUCATION

## SAT PREP

Your college-bound offspring might groan when they unwrap S.A.T. preparation software instead of a tape deck that costs just as much, but they'll thank you for it later. **Computer Preparation for the SAT** by Harcourt, Brace, Jovanovich includes 3 disks and a 50-page manual. They offer a fine 469-page book **How to Prepare for the SAT** (sold separately for \$7.95). **Krell's College Board SAT Exam Preparation Series** includes a 47-page booklet and an intimidating set of eight double-sided disks.

\$79.95, 48K disk. Harcourt Brace Jovanovich, 757 Third Avenue, New York, NY 10017. (800) 543-1918.

\$229.95, 48K disk. Krell Software, 1320 Stony Brook Road, Stony Brook, NY 11790. (516) 751-5139.

## WIZTYPE

No more hunting and pecking as you PEEK and POKE. You'll have fast fingers in no time, along with a laugh or two with the "Wizard of Id" comic-strip characters as your guide. WizType is more than a typing tutor—it teaches proper finger positioning, lets you create your own typing lessons, and includes an amusing game.

\$34.95, 48K disk. Sierra Online, P.O. Box 485, Coarsegold, CA 93614. (209) 683-6858.

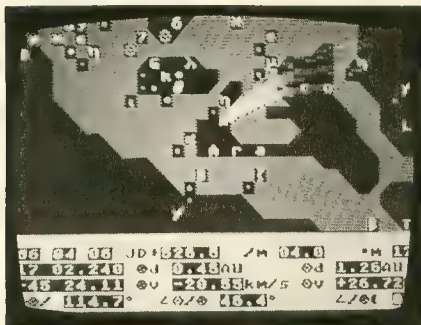


### DUCKS AHoy, SEAHORSE HIDE N' SEEK

You're in Venice in a gondola and have to pick up ducks who want to go to Lido Beach. But watch out for the hippo who upsets boats. Ducks Ahoy!, developed by Joyce Hakansson Associates, helps young children with their fine motor coordination and counting skills. The crisp graphics, adorable ducks and equally cute sound effects make Ducks Ahoy! one of the years' best.

Sea Horse Hide 'n' Seek is another Joyce Hakansson winner. By maneuvering a sea-horse through a coral reef and away from old wrecks and lagoon fish, this adventure program teaches kids about underwater life.

\$12.95 each, 16K cartridge. Ages 3-6. CBS Software, One Fawcett Place, Greenwich, CT 06836. (203) 622-2614.



### HALLEY PATROL

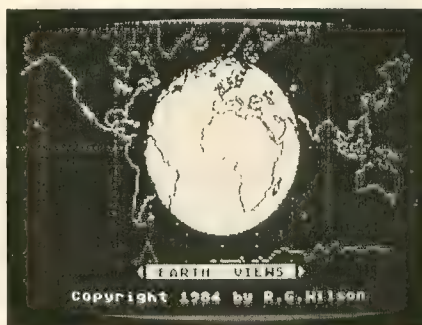
We can't imagine a more timely gift for the astronomy buff than Halley Patrol. With this joystick-driven, astronomically accurate program, you can watch the comet fly through space against a high-resolution scrolling map. Celestial coordinates indicate the best time and location to view the comet. Flip the disk for an educational graphic presentation on the history of Halley.

\$17.95, 48K disk. Ages 12 to adult. Antic Catalog, AP159.

### SPACE BASE

A must if you own a telescope. This graphically stunning scrolling map and space atlas offers detailed scientific data for hundreds of the brightest stars. With its extensive documentation, the program is equivalent to a college-level introductory astronomy class.

\$19.95, 48K disk. Ages 12 to adult. Antic Catalog, AP142.



### EARTH VIEWS

It's rare when educational software programs are more than just computerized textbooks. Earthviews is a computerized atlas and adventure/trivia game that features detailed high resolution maps and a 3-D view of earth rotating on any axis.

\$19.95, 48K disk. Ages 12 to adult. Antic Catalog, AP141.



### STICKYBEAR NUMBERS

Children's book illustrator Richard Heffer's Stickybear series is lauded by educators as an educational software classic. Stickybear shows flapping geese, waddling penguins and chugging trains in groups of one through nine, depending upon the number key that the child presses. Children

learn how to count, add and subtract, and get a Stickybear counting book, poster and stickers too.

\$29.95, 48K disk. Ages 3-6. Xerox/Weekly Reader, 245 Long Hill Road, Middletown, CT 06457. (203) 347-7251.

### TINK'S ADVENTURE, TUK GOES TO TOWN, TONK IN THE LAND OF BUDDY-BOTS, TINK'S SUBTRACTION FAIR

For years, writer Mercer Mayer has been delighting children (and the Antic staff) with his funny little mechanical monsters. In Tink's Adventure, children get a chance to learn the alphabet and the computer keyboard. When Tuk Goes To Town, there are adventures leading to spelling and vocabulary practice, memory building and hours of fun. Tonk in the Land of the Buddy-Bots has six games, each with four levels of play, ensuring a fairly long game time. Tonk's Subtraction Fair strengthens math skills as Tonk goes to a carnival and plays five different games. The animated robots and music will draw the whole family to the computer screen.

\$34.95 each, 48K disk. Ages 4-8. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062. (312) 480-7667.

### SPEEDREAD

Look out Evelyn Woods! This excellent, well-documented program increases your reading speed, improves eye movement, character and word recognition, and peripheral vision. Reading Compuserve at 1200 baud will be a piece of cake.

\$64.95, 16K disk. Inet Corp., 536 Weddell Drive, Sunnyvale, CA 94086. (415) 797-9600.

## COMMUNICATIONS

### HOMEPAK

This package integrates word processing, a filing manager and telecommunications—ideal for serious telecommunications users. Written by Russ Wetmore and used by all his fellow CompuServe SIG \* Atari sysops. It's worth buying just

# SOFTWARE

for HomeTerm, a telecommunications program that will work with just about any 300 or 1200 baud modem.

\$49.95, 48K disk. Batteries Included, 30 Mural Street, Richmond Hill, Ontario, L4B 1B5, Canada. (416) 881-9941.

## SMART 1030

For less than one tenth of the price of a Hayes Smartmodem, you can use Smart 1030 software to upgrade your 1030 modem for compatibility with the Hayes standard command set, plus additional features like autodial, onscreen help commands and a BBS database. It also allows you to use other popular modem programs without the hard-to-find Atari 850 Interface Module.

\$19.95, 16K disk. E&B Computer Services, P.O. Box 292506, Columbus, OH, 43229.

## BBS CONSTRUCTION SET

Now you can personalize your bulletin board without needing to write programs. Create online surveys, 65,792 security levels, private email and more. Supports 300, 1200 and 2400 baud modems.

\$24.95, 48K disk. Antic Catalog, AP146.

## CHAMELEON

If you want to log on to a mainframe from home, (or Kermit between an XL and an ST) you need the Chameleon CRT Terminal Emulator. This invaluable program lets your Atari act like a variety of computer terminals such as a DEC VT-52 or IBM 3031. Wide-screen 80-column emulation, UNIX-compatible, autodial. Supports Hayes-compatible and Atari 835/1030 modems.

\$19.95, 48K disk. Antic Catalog, AP113.

## BACKTALK

State-of-the-art telecommunications software for 300, 1200 and 2400 baud. With Backtalk your Atari can autodial other BBS's in the middle of the night and upload or download files in any of three protocols. Extra-large buffer supports 130XE

RAMdisk. You can create unlimited macro libraries. Written in compiled ACTION! by the programmers of Paper Clip and Synfile+.

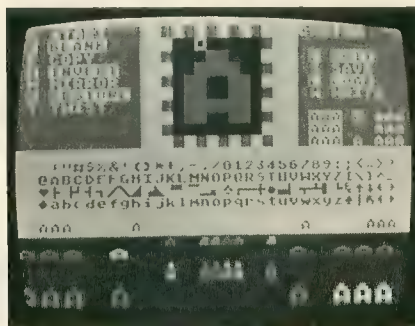
\$19.95, 48K disk. Antic Catalog, AP154.

## LANGUAGES & TOOLS

### BASIC XE

BASIC XL had long been the classiest, most powerful BASIC language available for Atari programmers. Now new BASIC XE is here from O.S.S. to harness the full 128K memory of the 130XE computer—yet it also works with Atari XL computers. BASIC XE is said to run Atari BASIC programs at least twice as fast, and it comes with an array of new statements, automated editing features and extra utilities.

\$79, cartridge plus 48K disk. Optimized Systems Software, 1221B Kentwood Avenue, San Jose, CA, 95129. (408) 446-3099.



### INSTEDIT

Create custom character sets with your joystick. Build arcade-style, high resolution game routines. Instedit has been used by more professional Atari programmers than any other character editor. Requires Atari BASIC.

\$15.95, 48K disk. Antic Catalog, AP117.

### ACTION!

This amazingly fast and powerful language blends elements of Pascal and C—but is much easier to program on the Atari. ACTION! contains a superior screen editor that makes programming a joy and was the

basis of the outstanding Paper Clip word processor.

\$99, 16K cartridge. Optimized Systems Software, 1221B Kentwood Avenue, San Jose, CA 95129. (408) 446-3099.

## DEEP BLUE C

C is the most widely accepted programming language for the new generation of big-memory personal computers like the ST. The Deep Blue C Compiler is a proper subset of C, so programs written for it will run almost without change on computers supporting the full language. Requires 48K, and a text editor such as Word Magic.

\$19.95. Antic Catalog, AP114.

## KYAN PASCAL

Finally, a Pascal for the Atari that doesn't require two disk drives and a computer science degree to use. This is a fast version with all of the features of Standard Pascal, the teaching and programming language widely used in colleges. Comes with a built-in editor, search and replace, and a library of graphics routines. Compiles files directly into assembly language.

\$69.95, 64K double density disk. Kyan Software, 1850 Union Street, #183, San Francisco, CA 94123. (415) 775-2923.

## MAC/65 ASSEMBLER EDITOR

If you want to program in assembly language, MAC/65 is the assembler editor to buy. It's compatible with the Atari Assembler Editor, as long as you don't use MAC/65's powerful extra commands. MAC/65 contains a speedy compiler and a truly excellent debugger.

\$80, 16K disk; \$99, 16K cartridge. Optimized Systems Software, 1221B Kentwood Avenue, San Jose, CA, 95129. (408) 446-3099.

## MMG BASIC COMPILER

Convert your BASIC programs into binary machine language files that will run up to 15 times faster than the original. Unlike other compilers, MMG will also produce

assembly source code which you can analyze and alter. Choose between integer and floating point arithmetic and put your data statements anywhere. Available in both double and single density, requires BASIC.

\$99.95, 48K disk. MMG Micro Software, P.O. Box 131, Marlboro, NJ 07746. (201) 431-3472.

## SHERLOCK 1050

With this disk sector editor you can customize any program in your library on the Atari 1050 (or 810) disk drive. You don't need to be an assembly language programmer to modify commercial software, alter programs to easily access RAMdisks, change title screens, customize menus, even disassemble from the disk itself. Any machine language file will reveal its secrets to Sherlock.

\$19.95, 48K disk. Antic Catalog, AP155.

# PRINTING

## PRINT WIZ

This powerful printer dump mixes text and graphics for hardcopies from most of the popular printers. Can print sideways on the page. Includes special handlers for popular graphics programs. Changes type size directly from your keyboard. By the author of Kwik Dump (Antic, March 1985).

\$29.95, 16K disk. Allen Macroware, P.O. Box 2205, Redondo Beach, CA 90278. (213) 376-4105.

## LISTER PLUS, PICTURE PLUS

These two utilities (sold separately) can stretch your dot-matrix printer to its limits. Lister Plus (\$19.95) among many other things, dumps any listed file (including programs) to the printer using any custom character set you choose. Picture Plus (\$29.95) manipulates most types of picture files, so you can save them in standard files that can be used with a BASIC program, or dump them to the printer in

any of four sizes. Requires BASIC and 48K disk.

Non-Standard Magic, P.O. Box 45, Girard, OH 44420. (216) 539-6033.

## PRINTSHOP (& LIBRARIES)

Just open any Atari users group newsletter to see samples of how popular this graphics printing program is. Virtually foolproof to operate, no wonder Print Shop is Broderbund's best seller. Unwrap this one before Christmas. In minutes, you'll be cranking out nifty Christmas cards, wrapping paper and signs.

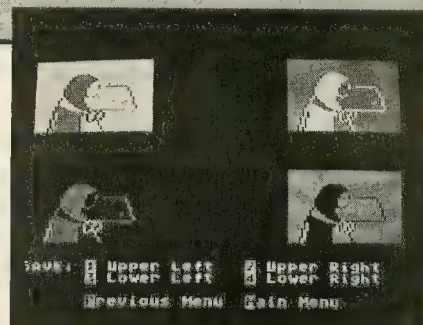


Volumes I & II of the **Print Shop Library** (\$24.95 each) are collections of icons, doodles and dingbats ranging from bowling pins to safety pins. These popular illustrations feed right into your Print Shop and pop up everywhere in newsletters, school reports, and brochures.

\$49.95, 48K disk. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

## GRAPHIC SHOP

Now you can use your graphics editing tools such as Micro-Painter, KoalaPad or Atari Touch Tablet to create decorative icons and graphics files for Broderbund's Print Shop graphics printing program. We've been using Graphics Shop at Antic to convert digitized photos taken with Computereyes into portraits of the staff. Then we print them out with Print Shop and place our faces on greeting cards, let-



terheads and other goodies to send home to Mom.

\$19.95, 48K disk. Antic Catalog, AP156.

# WORD PROCESSING

## PAPER CLIP

When we use a product day after day to produce this magazine, you know it has the Antic Seal of Approval. We write and edit every word with Paper Clip before transmitting the copy to our typesetter via modem. PC lives up to the manufacturer's claim that it's a professional word processor suitable for people who do heavy writing. Paper Clip is easy to learn, offers a split screen with cut-and-paste between both windows, one-key macros, readable characters with true descenders, double-column printing, and virtually every editing feature you'd find in word processing software at ten times the price.

\$59.95, 16K disk. Batteries Included, 30 Mural Street, Richmond Hill, Ontario, L4B 1B5 Canada. (416) 881-9941.

## LETTER PERFECT

Switching between modes (i.e. edit to print) as well as zipping throughout your document is a breeze with Letter Perfect. You can move from word to word, beginning to end of text easily. Letter Perfect lets you chain files (but not move text from one file to another) and runs easily with a variety of printers. It includes a spelling checker of approximately 30,000 words. If you want a larger dictionary to which you can add words, you can add LJK's **Spell Perfect** (\$79.95).

\$99.95, 32K disk. LJK Enterprises, 7852 Big Bend Boulevard, St. Louis, MO 63119. (314) 962-1855.

continued on page 44



**88K** *Lowest Price In The USA!* **152K**

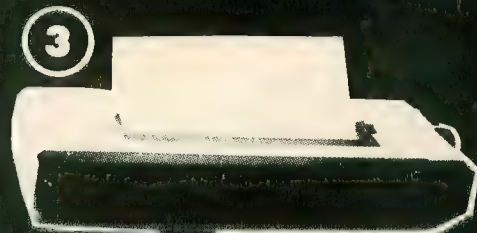
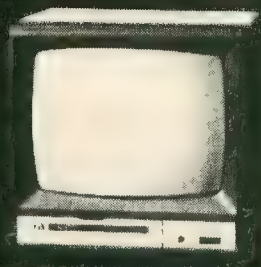
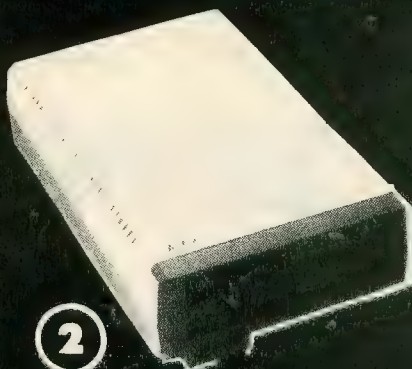
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| ☆ 13" Hi Resolution Color Monitor                 | \$399.00 | <b>179.95</b> |   |
| * ATARI 130XE 152K Computer                       | \$249.00 | <b>134.95</b> | Add \$10 for UPS  |

**15 DAY FREE TRIAL.** We give you 15 days to try out this ATARI COMPUTER SYSTEM!! If it doesn't meet your expectations, just send it back to us prepaid and we will refund your purchase price!! **90 DAY IMMEDIATE REPLACEMENT WARRANTY.** If any of the ATARI COMPUTER SYSTEM equipment or programs fail due to faulty workmanship or material within 90 days of purchase we will replace it IMMEDIATELY with no service charge!!

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22292 N. Pepper Rd., Barrington, Ill. 60010

**312/382-5050 to order**

# GIANT PRINTER SALE!!

List \$399.00

**10" Printer**

**SALE \$179<sup>00</sup>**

**1 Year Warranty**

**120-140 CPS**

**Premium Quality**

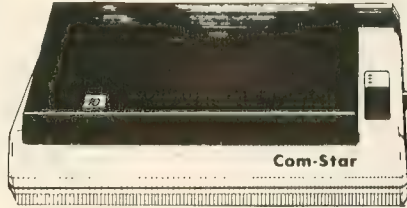
List \$599.00

**15½" Printer**

**SALE \$249<sup>00</sup>**

**10" Comstar 10X** — This Bi-directional Tractor/Friction Printer prints standard sheet 8½"x11" paper and continuous forms or labels. High resolution bit image graphics, underlining, horizontal tab setting, true lower descenders, with super scripts and subscripts, prints standard pica, compressed, expanded, block graphics, etc. Fantastic value. (Centronics parallel interface.)

List \$399.00. Sale \$179.00.



**15½" Comstar 15X** — Has all the features of the 10" Comstar 10X plus a wider 15½" carriage and more powerful electronics to handle large ledger business forms! (Better than FX-100). The 15½" Comstar 15X also prints on standard size paper and continuous forms and labels. Fantastic value. (Centronics parallel interface.)

List \$599.00. Sale \$249.00.

List \$499.00

**10" Printer**

**SALE \$229<sup>00</sup>**

**1 Year Warranty**

**150-170 CPS**

**High Speed**

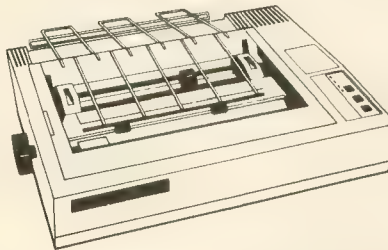
List \$699.00

**15½" Printer**

**SALE \$299<sup>00</sup>**

**10" Comstar 160+ High Speed** — This Bi-directional Tractor/Friction Printer combines the above features of the 10" Comstar 10X with speed (150-170 cps) and durability. Plus you get a 2K buffer, 96 user definable characters, super density bit image graphics, and square print pins for clearer, more legible print (near letter quality). This is the best value for a rugged dependable printer. (Centronics parallel interface.)

List \$499.00. Sale \$229.00.



**15½" Comstar 160+ High Speed** — This Bi-directional Tractor/Friction Printer has all the features of the 10" Comstar 160+ High Speed plus a wider 15½" carriage and the heavy duty electronics required for today's business loads. You can use large ledger business forms as well as standard sheets and continuous forms and labels. This is the best wide carriage printer in the U.S.A. (Centronics parallel interface.)

List \$699.00. Sale \$299.00.

List \$599.00

**10" Printer**

**SALE \$259<sup>00</sup>**

**Lifetime warranty\***

**165-185 CPS**

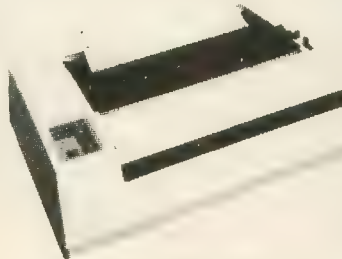
**High Speed & Letter Quality**

List \$599.00

**10" Printer**

**SALE \$259<sup>00</sup>**

**10" Comstar 2000** — The ultimate printer has arrived! This Bi-directional Tractor/Friction Printer gives you all the features of the Comstar 160 plus higher speed (165-185 cps), 256 downloadable characters, proportional setting, external dark printing mode and a \*lifetime printhead warranty. PLUS ...



With the flip of a switch you can go into the letter quality mode which makes all your printing look like it came off a typewriter. Turn in term papers, do articles or just print programs. Have the best of letter quality and speed in one package. Fantastic printer (Centronics parallel interface.)

List \$599.00. Sale \$259.00.

**• 15 Day Free Trial — 1 Year Immediate Replacement Warranty Parallel Interfaces**

Commodore-64, VIC 20 — \$39.00

Atari — \$59.00

Apple II, II+, IIe — \$59.00

Add \$10.00 (\$14.50 for 15½" Printers) for shipping, handling and insurance. Illinois residents please add 6% tax. Add \$20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.

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# SOFTWARE

## ATARIWRITER+

As **Antic** goes to press, we've only seen an early beta test copy of **AtariWriter+**. But if it gets to the stores in time for the holidays you should check it out—especially if you're a fan of Atari's original word processing software. **AtariWriter+** promises a built-in mail merge and spelling checker, plus full use of the 130XE's extra memory for file space.

\$49.95 approximately. Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

## WORD MAGIC

This new, enhanced version of the **Word Magic** word processor has pop-up menus, online help files, cut and paste features, and a variety of type fonts—all for under \$20. Use a joystick or trackball to move the cursor and scan files rapidly. Comes with **Graphic Magic** bonus program that mixes your own graphics with text for printing on an Epson or Gemini. Now uses extra memory in 130XE computer.

\$19.95, 48K disk. Antic Catalog, AP130.

## SPELL MAGIC

Daniel Webster would roll over in his grave if he could see this 34,000-word integrated computerized dictionary. Run your **Word Magic** (or other **AtariWriter**-compatible) documents through this spelling checker and watch mistakes disappear. **Spell Magic** has online help, online menus, and lets you add your own dictionaries of up to 10,000 words each.

\$19.95, 48K disk. Antic Catalog, AP144.

\$24.95 for all three—**Spell Magic**, **Word Magic** and **Graphic Magic**.

## productivity

## SYN CALC, SYN FILE+

This spreadsheet and database are the keystones of the best integrated (file-compatible) productivity applications series for the Atari currently available. Each

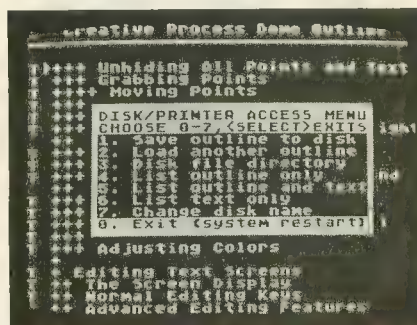
program in the series is powerful, yet easy to operate with pop-up menus and simple commands. **SynCalc** is the best Atari spreadsheet on the market, and it's compatible with **VisiCalc** files. **SynFile+** is a powerful database system, but under hard use it reveals some bugs and has inadequate report writing capacity. Also in the series: **Syntrend**, a combined graphing and statistical program; **SynStock**, which tracks and displays charts of your stock market holdings.

\$49.95 each, 48K disk. Synapse (Broderbund) Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

## HOME ACCOUNTANT

This popular package has been around a while on many different computers. Menu-driven **Home Accountant** tracks five checkbooks, displays graphs, makes balance sheets and forecasts. It can even print checks, a highly useful feature for professionals and small businesses that don't need a full accounting system. Compatible with Continental's annual **Tax Advantage** (\$69.95), which does year-round tax planning and then prints out your Form 1040 line-by-line.

\$74.95, 48K disk. Continental Software, 671 Valjean Avenue, Van Nuys, CA 90045. (800) 421-3930.



## CREATIVE PROCESS

**Creative Process** is the Atari's first outline processor like "Think Tank." It's a conceptual organizing tool for making sense out of your busy agenda. This calendar, project manager, and time manager will make it easier for you to be more productive and creative.

\$19.95, 48K disk. APX AP151.



## HOMECARD

**HomeCard** moves you closer to a paperless desk. This computerized rolodex file brings your Christmas list, mailing list, personnel files and little black book into the electronic age. Create and print custom labels, even autodial phone numbers with an Atari 1030 or Hayes-compatible modem. From **Sparky Starks and Russ Wetmore**, who programmed **HomePak**.

\$24.95, 48K disk. Antic Catalog, RW100.

## PEACHTREE ACCOUNTING

Finally, there is a genuine business accounting package for the Atari that handles most needs of a professional office, retailer, or other small company. **Peachtree's Back To Basics** accounting system was successful on the IBM and Macintosh before the Atari version came out. Includes **Accounts Payable**, **Accounts Receivable** and **General Ledger** modules. Prints attractive reports, address labels, even computer-issued checks. Computes finance charges, produces customer master lists and sales journals.

\$195, 48K, two disk drives required. **Peachtree Software**, 3445 Peachtree Road N.E., Atlanta, GA 30326. (404) 239-3165.

## DATA PERFECT

This powerful database comes from the same company that makes the **Letter Perfect** word processor—so it's no surprise that the two programs are compatible. While not as easy to learn as **Synfile+**, **Data Perfect** has better report writing and global change capability. Works best with two disk drives.

\$99.95, 32K disk. LJK Enterprises, 7852 Big Bend Boulevard, St. Louis, MO 63119. (314) 962-1855.



**ST**

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*FIRST ANNUAL ANTIC*  
**ST**  
**SHOPPERS**  
**guide**

# ST SHOPPERS GUIDE

## ATARI PERIPHERALS



### CD ROM

Atari is racing to have its CD ROM unit available shortly after the first of the year. As covered in our October 1985 issue, an entire encyclopedia takes up only one-fifth of one compact digital laser disk, and any entry may be accessed in less than four seconds. The first software available will be the Grolier Encyclopedia. By itself, CD ROM technology is enough of a reason to buy the ST.

\$599 (tentatively)

### DISK DRIVES

Double your ST data storage with a second 3 1/2-inch disk drive. The Atari ST354 single-sided, double-density drive holds 349K after formatting. And if that's not enough, go for the ST314 double-sided drive with 714K.

\$199.95—SF354 Single-sided

\$299.95—SF314 Double-sided

### VIDEO MONITORS

You have a choice of monitors with your ST. The SM124 monochrome monitor offers the highest resolution of 640 X 400 pixels. Or you can choose the SC1224 RGB Color monitor, which draws from a palette of 512 colors.

\$199.95—SM124 Monochrome

\$399.95—SC1224 RGB Color

### PRINTERS

As **Antic** went to press, Atari told us that

two new printers for the ST would be coming in October. The letter-quality SDM124 is a daisy wheel printer. The SMM804 dot-matrix model supports graphics and prints 80 characters per second. Either model connects to the ST's Centronics parallel port.

\$269.95—SDM124 Letter Quality

\$229.95—SMM804 Dot Matrix

Atari Corporation, 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000. (Model numbers and prices of Atari Corporation products are subject to change.)

## LANGUAGES

### 4xFORTH

Not counting the Logo that shipped with the ST, 4xForth was the first software for the machine—and the first alternate language. Designed primarily for developers, this 83 Standard Forth includes such sophisticated features as multi-tasking and multi-user capabilities. This version accesses the ST graphics through primitive, lower-level "line A" calls. Later packages will include complete GEM access. See our review in this issue.

\$99.95. Dragon Group, 148 Poca Fork Road, Elkview, WV, 25071. (304) 965-5517.

### HIPPO-C, HABA SOLUTIONS: BUSINESS LETTERS, WILLS

Hippo-C (\$74.95) was eagerly awaited by the first wave of ST buyers who did not know Forth and wanted something more powerful than LOGO. The Haba implementation comes complete with an editor, standard C library and GEM linking and binding files. Look for a review on this product in the **Antic** ST Section soon.

Haba Solutions: Business Letters (\$49.95) is a text editor plus a collection of standard letter formats frequently used in business. Choose your letter needs then plug in your own information. Since letters may be created from scratch, this program doubles as a word processor.

Design your own will with Haba Solu-

tions: Wills (\$49.95). Several standard wills are included for single, married, male, female, etc. You can't cheat death, but you might cheat your attorney out of a fee.

Haba Systems, 15154 Staggs Street, Van Nuys, CA 91405. (800) HOT HABA; in California (800) FOR HABA.

### PHILON BASIC

Philon has been developing compilers for the 68000 for some time. However, their first product for the ST, is a BASIC interpreter. Philon BASIC is a subset—and forerunner—of their more powerful and advanced compiler, Philon FAST/BASIC-M. Philon BASIC offers full syntax compatibility with the compiler BASIC, so programs may later be easily transferred to the more sophisticated programming environment. Features include multi-line, user-defined functions, sequential files, a library of predefined functions and a full range of control statements.

\$49. Philon, Inc., 641 Avenue of the Americas, New York, NY 10011. (212) 807-0303.

## UTILITIES



### C.O.L.R. OBJECT EDITOR

This is the Antic Catalog's first professional ST program. Designed by Rugby Circle as an in-house graphics utility for development of Joust on the ST, C.O.L.R. Object Editor is not really "paint" software, but a programmer's tool which creates source-code byte arrays of "sprite" images for use in various languages. It also allows access of picture files created by other ST graphics programs.

\$29.95. Antic Catalog, ST201.

## DISK LIBRARY

Disk Library is a disk cataloging utility that will organize and keep track of all your files and programs. You can insert comments on any file at any time and search your library by date, filename, size, extender, or any word or words in the comment string. You may also sort your files and print the library using the same categories.

\$39.95. Extended Software, 11987 Cedar Creek Drive, Cincinnati, OH 45240. (513) 825-6645.

## Applications



## EXPRESS

Another first: the earliest ST application software. Express is a letter and small documents processor. Originally designed for the Macintosh and IBM PC, Express was adapted for the Atari ST within an incredible *three weeks*! The package includes a simple word processor and a customized database for easy-to-create mail merge documents.

The ST version was given an extra bonus. After the authors monitored SIG \* Atari, they added a terminal program capable of uploading and downloading text files (but not binary). In addition, since files created with Express contain no special printer control characters, the program can be used as a text editor for C or machine language source code.

\$49.95. Mirage Concepts, 4055 W. Shaw, #8, Fresno, CA 93711. (800) 641-1441; in California (800) 641-1442.



## PORTFOLIO, DEGAS, HOMEPAK

Batteries Included has been busy (as usual) and offers the following three programs for the ST.

Portfolio (\$249.95) is written by Lee Isgur, First Vice President of Paine Webber. It's designed for private investors or broker analysts who need information management support to make more efficient decisions. Portfolio gives advice on what to sell and when. It includes a "suppose/what if" forecasting module and terminal software to get you on-line with Dow Jones.

DEGAS (\$39.95), which stands for Design and Entertainment Graphics Arts System, is a paint program written by Tom Hudson. It operates in all three of the ST graphics modes and is extremely simple to use. All of its key functions can be user-defined and include brush patterns, fill patterns, colors, and fonts. (Yes, FONTS!)

The popular HomePak (\$69.95), by Russ Wetmore, has been adapted to the ST. This is a brand new HomePak. Its strongest feature is still its terminal program, but the database module has been improved with increased memory and the word processor has been enhanced.

Batteries Included, 30 Mural Street, Richmond Hill, Ontario, L4B 1B5 Canada. (416) 881-9941; in California (416) 881-9816.

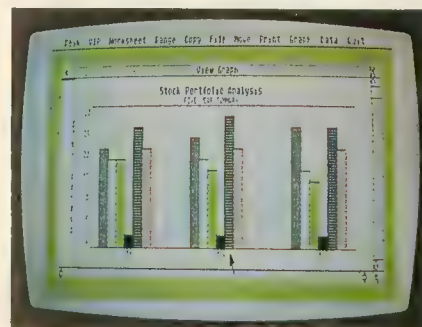
## CHAT

This is the first available ST terminal program with XMODEM file transfers. Wynne Rostek at SST Systems knew there were plenty of new ST owners starving for a good terminal program, so he rushed Chat to the market. The program doesn't look rushed—and we've seen it at work.

Chat offers ASCII file transfers using XON/XOFF protocol, XMODEM transfers of any kind of file, and you can upload

messages and email on CompuServe. It works with dumb modems and Hayes-compatible smart modems, and operates in all three Atari ST resolutions. Most commands require only a single keystroke. And get ready for the price. . .

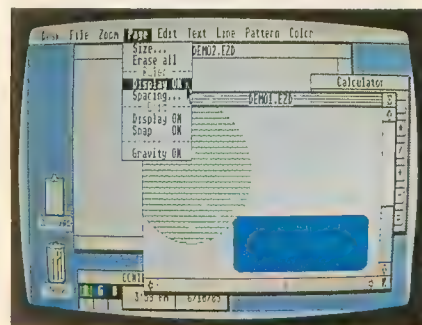
\$19.95. SST Systems, P.O. Box 2315, Titusville, FL 32781. (305) 269-0063.



## VIP PROFESSIONAL

The VIP Professional is an integrated spreadsheet package which is identical to Lotus 1-2-3 in features and commands. But VIP takes advantage of the Atari ST's advanced features by providing enhanced graphics and an easy-to-use interface. Special details include a 4X magnified spreadsheet and enhanced database characteristics.

\$149.95. VIP Technologies, 132 Aero Camino, Santa Barbara, CA 93117. (805) 968-4364.



## EASY-DRAW

This is the first in a series of graphics software from Migraph. Easy-Draw includes multiple drawing windows, user-defined patterns, sophisticated zooming, and a pop-up drawing menu. Easy-Draw—which is also designed for impressive hard-copy printouts—is to be followed by DrawWrite, an integrated text/drawing proces-

# The Crimson Crown™

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interactive novel featuring  
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Software, Inc.

# ST SHOPPERS GUIDE

sor, scheduled for release in the first quarter of 1986.

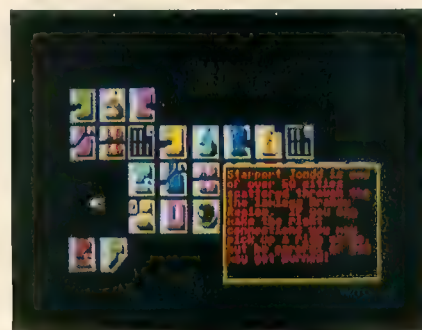
\$99.95. Migraph, Inc., Consumer Applications Division, 720 S. 33rd Street, Suite 201, Federal Way, WA 98003. (206) 838-4677.

## LIFE ORGANIZER, ENTERTAINMENT JACKPOT

Life Organizer is a collection of household-level business application programs. Included is a 64-column by 192-row spreadsheet with 20 templates, an outline processor, filing program, decision maker, and more. Entertainment Jackpot contains 14 programs including Checkers, Othello, Cribbage, 3-D Tic-Tac-Toe, an advanced "Eliza" called Therapist and a covey of casino games. It also has three adventure games—two with animated graphics—and an adventure creator program with a three-phrase machine language parser. The programs, which are all written in BASIC, may be listed and examined.

\$34.95 each. Martin Consulting, 94 Macalester Bay, Winnipeg, Manitoba, R3T 2X5 Canada. (204) 269-3234.

\$44.95. Infocom, 55 Wheeler Street, Cambridge, MA 02138. (617) 492-6000.



## SUNDOG

SunDog: Frozen Legacy, a big hit with the Apple crowd, is receiving some graphic enhancement for the Atari ST. Described as a "ZoomAction Adventure," Sundog is a high-tech, sci-fi, fantasy role-playing game with windows. At press time, impressive demo disks of the game were being distributed by the company, which expects a release date of October 1985.

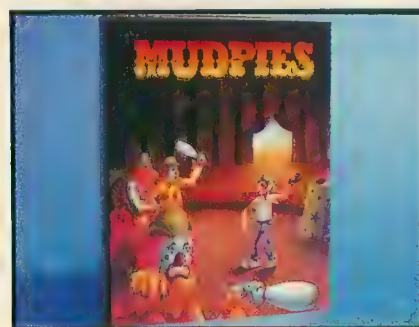
\$39.95. Accolade Software, 20863 Stevens Creek Boulevard, Cupertino, CA 95014. (408) 446-5757

## GAMES

### A MIND FOREVER VOYAGING

Trust Infocom to get out the first game for the ST. A Mind Forever Voyaging (AMFV) is also the first Infocom game to use 128K of memory. It was written by Steve Zetzkay, co-author of "Hitchhiker's Guide to the Galaxy" and author of "Planetfall" and "Sorcerer." AMFV is set in the year 2031. You have just been given the traumatic news that you are a robot, and all those happy memories of human childhood were nothing but implants. A global crisis is brewing and you have a mission... AMFV is the first in a new series of "Interactive Fiction Plus" titles. The series uses a new development system and an increased vocabulary of 1,700 words.

Infocom has also released all of their previous titles for the ST. If you haven't tried an Infocom adventure, you owe yourself the pleasure. Any one will do, they're all good.



### MUD PIES, FLIP SIDE

Mud Pies (\$24.95) is an arcade game featuring Arnold the mischievous mud-pie flinger and a circus full of chaotic clowns. Flip Side (\$34.95) is a form of Othello for the ST. Besides games, Michtron is releasing an IBM/Atari file transfer utility, a RAM-disk, and a communications program called MI-TERM.

Michtron, 576 S. Telegraph, Pontiac, MI 48053. (313) 334-5700.

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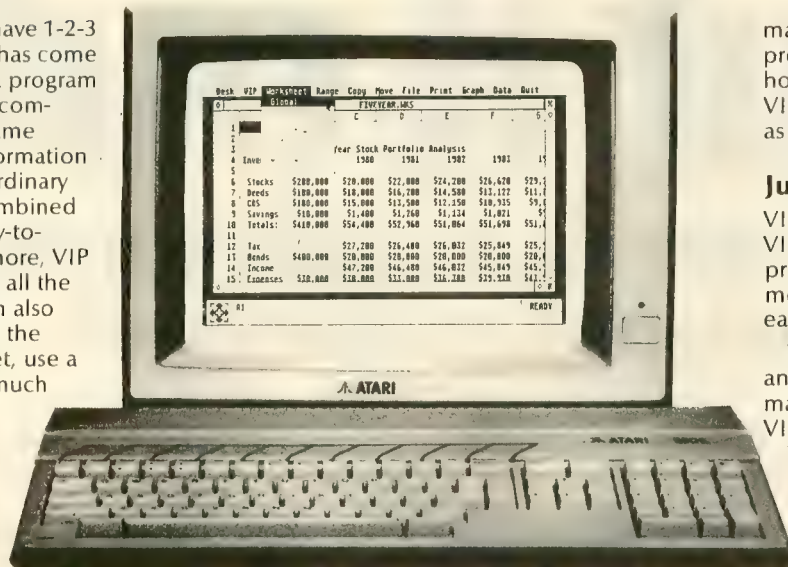
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| 123 Files        | Yes | Yes   |
| Enhanced Graphs  | Yes | No    |
| Uses mouse       | Yes | No    |
| Drop-Down Menus  | Yes | No    |
| Icons            | Yes | No    |
| GEM interface    | Yes | No    |
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| Easy to use      | Yes | No    |
| Affordable       | Yes | No    |

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# 4xFORTH

## First serious language for ST users

by RON BRAITHWAITE

**4xFORTH** is a full-scale implementation of the Forth language for Atari ST computers. This product has been used successfully in process control, robotics and similar applications on the MC68000 microprocessor for the past three years—and on the Digital Equipment Corp. PDP-11 minicomputer even before that.

4xFORTH will run on an ST with a single disk drive, and on either a medium-resolution color monitor or high-resolution monochrome monitor. The 4xFORTH editor will not run properly on a low resolution display, although applications written in 4xFORTH can use low resolution.

### UNDERSTANDING FORTH

If you haven't programmed in Forth, let's start with a little bit of background about how the language works.

Programming in Forth involves creating procedures called words. A Forth word is placed in the dictionary after being defined by its relationship to other words.

Two completely different words can have the same name in Forth, with the most recent word being the one found when looked up in the dictionary. It is possible to have two different words with the same name active at different times, depending on their context.

For example, the word FISH might have two different meanings. If FISH is used as a noun, it refers to a creature that lives in water. If FISH is used as a verb, it refers to an attempt to catch the elusive little beastie.

The way these distinctions are made in Forth is with the vocabulary structure. Its usage is like this:

VOCABULARY NOUNS / create the NOUNS vocabulary  
VOCABULARY VERBS / create the VERBS vocabulary

NOUNS DEFINITIONS / Place new words in NOUNS  
:FISH ." Critter that lives in the water." ;

VERB DEFINITIONS / Place new words in VERBS  
:FISH ." Catch the critters living in the water." ;

NOUNS FISH critter that lives in the water.

VERBS FISH catch the critters living in the water.

### HANDLING FILES

Up to eight files may be open at the same time with 4xFORTH. The files may be opened with the options of Read Only, Write Only, or Read/Write. When files are opened, they must be assigned a word which parses the file name into a form that GEMDOS accepts. Then the file is assigned a channel number and its open options. For example:

```
$FILE BMAIN B: FORTH.BLK"
```

```
1 BMAIN 2 FOPEN
```

This creates an entry for the file name B:FORTH.BLK and then opens the file using channel 1 with Read/Write (the 2) attributes. Files can be created with Read/Write, Read Only, Hidden, System/Hidden, and Volume Label attributes.

For those not familiar with it, the primary Forth primitive for dealing with mass storage is BLOCK.

Forth divides mass storage in 1024-byte blocks, allowing for very fast random access. This method gives the programmer absolute freedom to create whatever structures are needed, without the overhead of unneeded structures. But because the program editor treats a block as 16 lines of 64 characters, leaving a blank line in the middle of a block leaves 64 bytes of spaces which can create very bulky files.

The Dragon Group told me they would provide a utility to load files edited with non-Forth editors, such as Mince. This should solve the space problem. But you lose much of the interactive nature of Forth if you must exit to edit your program files.

A very nice feature of 4xFORTH is its support of a RAM-disk. This means unused memory can be allocated and used as an electronic disk drive which is much faster than either a floppy or hard disk—although when the power

continued on page 53

# kyan

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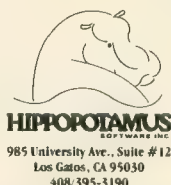
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All products listed available for the Atari 520ST.



## 4X FORTH

continued from page 51

is turned off, of course, the contents of the RAM disk are lost. To use the RAMdisk, simply enter:

```
<#blocks> SET.RAMDISK
```

Blocks from the currently selected file can be copied from the file to the RAMdisk with F>R and, when finished with the RAMdisk, they copy back to the file with R>F.

A highly advanced feature of 4xFORTH is its built-in support of satellite processors. This means a second ST—with or without disk drives—can be attached to the serial port. The implication here is that 4xFORTH can support a Local Area Network! However, this subject is a little too complex for further detailing in a review.

The 4xFORTH editor will work with the mouse for cursor positioning. The left mouse button moves back a block and the right mouse button moves forward a block—the blocks are first saved automatically.

In 4xFORTH, it is unnecessary to keep track of exactly where different words are defined. The editor also supports use of the function keys, with control key sequences for additional functions.

## GRAPHICS

The graphics system has Tektronix 4010 emulation. This is important, because more software has been written for the 4010 series display terminals than for any other graphics display. Source code written for Tek 4010 displays can be easily converted.

The graphics system is very well developed, with primitive routines such as GET.PIXEL, PUT.PIXEL, DRAW.LINE, Tek 4010 emulation routine MOV, RDRW and complex routines like RECTANGLE, POLYGON, +SPRITE, -SPRITE, and much more.

A full GEM interface has been promised for the level 2 version of 4xFORTH.

## THE ASSEMBLER

Commercial Forth packages have assemblers that vary greatly in quality and documentation. But like everything else I have seen so far from the Dragon Group, their 4xFORTH assembler is first-rate.

The manual's Chapter Five provides an excellent discussion of programming in assembler on the 68000. There is a very complete discussion of addressing modes and instruction set features. Overall, it is the best documentation of a Forth assembler I have ever seen.

This is not to say the chapter is a complete introduction to programming in assembler. Like the rest of the manual, it assumes that the reader is an experienced all-around programmer, familiar with a variety of languages and processors.

The assembler itself has very complete error-checking for illegal addressing moves and other quirks of the 68000. As anyone who has attempted to program the 68000 in assembly language can attest, this processor has more than its share of idiosyncracies. The assembler helps watch out for them.

## MULTI-TASKING

4xFORTH comes with a built-in multi-tasker. This means that although the ST cannot do two things simultaneously with GEMDOS—with 4xFORTH it can!

4xFORTH multi-tasking uses a cooperative round-robin scheduler that is very clearly documented, with a good comparison of time slice versus round-robin techniques.

Needless to say, this is another very complex subject. Yes, you can run a two-user system on the ST—simply by connecting a terminal to the serial port. However, for anything more complex, be prepared to deal with ST system internals.

## PERFORMANCE

4xFORTH is *fast*. . .

Since the heritage of this language is control of time-critical processes, great effort has been made to optimize performance. This is reflected in speed of execution. Under 4xFORTH the 520ST does one pass of the Sieve of Eratosthenes in 1.1 seconds. (*In the October, 1985 issue, Antic clocked this test at 3.8 seconds for an ST running Digital Research C. The fastest time tested was 1.97 seconds for a minicomputer using C on UNIX.*—ANTIC ED)

And if this is not fast enough, there are also two optional Accelerator packages which greatly increase the speed, at minimum penalty in program size.

This is the fastest version of Forth that I have ever seen.

## THE MANUAL

With complex software such as a programming language, the quality of the manual is virtually as important as the quality of the program itself. From my point of view as a professional programmer, I am pleased to say that both are extremely well done.

But there are some problems. The manual can overwhelm a novice programmer, as can any language technical manual. A more serious problem is that there are a number of words in the kernel (the base system) which are not documented. This can be justified, I suppose, under the argument that the undocumented words are internals which should not be used.

The authors realize the problems of complexity in the manual and address it by suggesting the novice read Leo Brodie's classic books, "Starting Forth" and "Thinking Forth." In addition, I recommend Anita Anderson and Martin Tracy's "Mastering Forth" and Margaret Armstrong's "Learning Forth." All these books are available from the Forth Interest Group, P.O. Box 8231, San Jose, CA 95155. FIG also offers Forth Dimensions magazine, a must for every Forth programmer.

(*Antic wants to re-emphasize that 4xFORTH was primarily designed as a tool for professional software developers already familiar with the Forth language. Understanding the 4xFORTH documentation can be quite difficult without this advanced level of technical expertise.*—ANTIC ED)

continued on next page

## PROBLEM AREAS

Although this system is intended for professional development, there are some frustrating shortcomings.

- There is no binary save. The source must be reloaded each time an application is to be run. The Dragon Group plans on providing this essential feature in the near future.
- There is no target compiler. A target compiler allows you to generate a minimal system for a specific application, at the cost of increased complexity. The Dragon Group is promising an overlay mechanism and that may be sufficient. But until this feature and the binary save are available, commercial applications are not feasible.
- There are a number of undocumented words in the system, plus a number of words missing that are specified in the Forth 83 Standard. Not many, but enough to be frustrating.
- The editor is included in the kernel. This occupies space that could otherwise be used by an application.
- A number of features (such as the RAMdisk) are discussed in one part of the manual, but not listed in the index.
- There is no decompiler or step-wise debugger. These important features are part of the F83 Public Domain model (available on CP/M, CP/M-86, MS-DOS, and CP/M-68K). There are a number of other features in F83 that

should be implemented as well. The F83 model is one which vendors should pay attention to in their implementations.

Although these problems are annoying, they are not fatal flaws.

## CONCLUSIONS

The Dragon Group has created an excellent version of Forth in this product. 4xFORTH is incredibly fast and has many of the tools and extensions needed by the software engineer.

Despite some shortcomings, the quality of the software and the manual make this a system that novice programmers can use to learn Forth. At the same time, 4xFORTH is ideal for the professional, once some minor flaws are fixed.

I believe that 4xFORTH is the most advanced programming environment available on the Atari ST so far.

4xFORTH

Dragon Group

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*Software engineer Ron Braithwaite is currently the Forth group leader for Rising Star Industries, developing the Valdocs applications software series for the Atari ST and other computers.*



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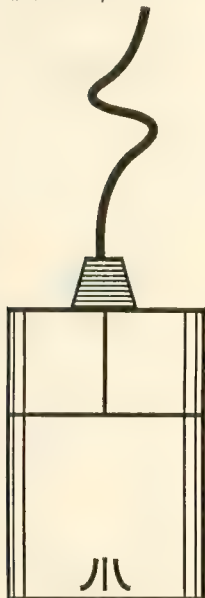
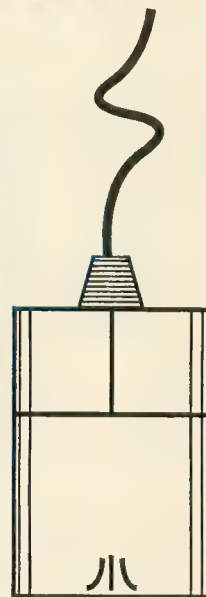
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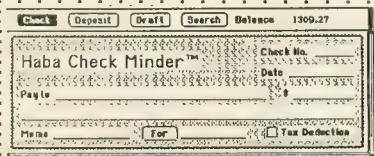
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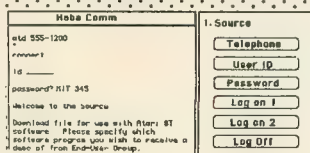
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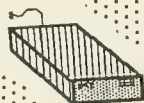
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# INTRODUCING 520ST ASSEMBLY LANGUAGE MC 68000 tutorial

by CHRIS CHABRIS

To a programmer, the most important feature of any computer is its "brain," the central processing unit (cpu). And the Atari 520ST sports the most advanced cpu ever put into a personal computer—the 16-bit Motorola MC68000 microprocessor running at a clock speed of eight megahertz.

My first encounter with the 68000 occurred in a course on systems programming that I took last year at Harvard. Having learned machine language on the 6502 microchip in Atari's 8-bit computer line, I was pleasantly surprised. The 68000 instruction set seems like a high-level language, compared to the 6502.

Using a Macintosh computer, we constructed several large programs in 68000 assembly language, including an assembler, spreadsheet, and language interpreter. But then when I returned to an Atari 130XE, writing simple utilities seemed like using knives and bearskins to build a computer.

## 68000 FAMILY

What is it about the 68000 that makes the trusty 6502 seem so crochety? Before we can answer that question, we must clarify what we mean when we say 68000.

In 1979 Motorola introduced a new family of general purpose microprocessors with the 68000 chip. (In the May, 1985 *Antic*, *Meet the 68000* provides a basic description of the 68000 itself.) Although code written for the 68000 is compatible with all subsequent chips, there are some significant variations within the family:

- The 68008 is a version of the 68000 that addresses only one megabyte of memory and uses an 8-bit data bus. It transfers data, to and from memory, one byte at a time instead of two. This chip is used in the Sinclair QL computer.
- The 68010 has a few additional instructions, operates faster in certain loop situations and supports virtual mem-

ory. Part of the address space is stored on external mass storage and "paged" in and out of main memory in order to simulate larger contiguous RAM than actually exists. This chip is used for running Unix in the AT&T 7300 PC.

- The 68020 is the true 32-bit version of the 68000, with data and address busses both 32 bits wide. It also supports the 68881 floating-point co-processor and many additional instructions. A so-called instruction cache holds the next instructions to be executed within the processor, so they do not have to be fetched from main memory each time.

## 68000 OVERVIEW

We can familiarize ourselves with the power of the 68000 by examining a simple program in excruciating detail. But if you have never seen 68000 assembly language before, there are a few things you need to know first.

Within the 68000 chip are eight general-purpose data registers—each 32 bits wide—labeled D0-D7. They can act like either the accumulator or the index registers in the 6502. There are seven 32-bit-wide address registers labeled A0-A6, and a 32-bit stack pointer labeled A7 or SP. The stack pointer points to an absolute address in the computer's memory, unlike the 6502 stack pointer which is an 8-bit offset to address \$0100.

The 68000 instructions can operate on either a 8-bit byte, a 16-bit word, or a 32-bit longword. Bytes can be located at any address, but words and longwords must begin at even addresses. The size is denoted by affixing either a "b", "w", or "l" to the instruction mnemonic, as in **CLR.W D0**, which would clear, or set to zero, only the first 16 bits of register D0.

## SAMPLE PROGRAM

Armed with this information, you should look at the listing in *Figure 1*. This is a short subroutine that computes

continued on next page

the sum of the first N even natural numbers—or  $2 + 4 + \dots + N$ .

As the header comments indicate, the parameters are passed to and from the subroutine in the data registers.

Figure 1

```
; Compute the sum of the first N even natural numbers.
; N is passed in register D0, and register D1 will
; contain the intermediate and final results. Method:
; the first N numbers are summed by counting down D0
; and adding its value into D1 until D0 reaches zero.
; Then D1 is multiplied by 2.

evensum:  clr.l  D1          ;Zero-out
          ;Accumulator
sumloop:  add.l  D0,D1       ;Add current
          ;counter value to accumulator

          subq   #1,D0       ;Decrement
          ;counter by one
          bne    sumloop     ;until it
          ;reaches zero
          muls   #2,D1       ;Double sum to account
          ;for even numbers
          rts               ;Return
          ;to caller
```

D0 on entry contains the number of numbers to add, and D1 on exit will contain the result. Note that the subroutine does no error checking. So if the first N even natural numbers cannot be summed in a longword (the maximum size of D1), an incorrect result will be returned.

The program begins by clearing out register D1.l. (This notation references D1 as a longword. D1.b, for example, would indicate the first eight bits of D1.) Note that with the 6502, this 2-byte instruction could only be roughly simulated with well over 10 bytes of code!

Now the loop begins. In the loop, the program must add the value of register D0 to D1 and decrement D0 until it reaches zero, an algorithm which is executed by three instructions.

The first instruction adds D0 into D1 using the ADD instruction. Like most 68000 instructions, ADD takes two operands of any size: source and destination. Although both operands are data registers, in this case only one need be. Special variations on the ADD instruction—ABCD, ADDA, ADDI, ADDQ, and ADDX—take care of most other addressing situations and give the 68000 great arithmetic flexibility.

The SUBQ instruction is used next to decrement counter D0 by one. SUBQ is a special form of SUB. It only operates on longwords and subtracts an immediate value from 1 to 8 from the second operand. However, it is faster and more compact than the standard SUBI instruction, which can handle immediate operands of any size.

6502 hackers will find the familiar BNE instruction at the bottom of the loop, and it indeed acts just as its 6502 counterpart. It is one of a family of 15 branching instructions available on the 68000, each of which uses a word-size displacement. The address referenced in a branch instruction can occur up to approximately 32K bytes before or after the instruction itself.

The loop has ended, but one essential task remains. The accumulated sum must be doubled to account for the sum of the even numbers.

This is accomplished by the powerful Muls instruction, which here multiplies two by the value in D1 and stores the result in D1. 6502 fans will note that the same thing can be accomplished on that chip with the ASL and ROL instructions. But what if we wanted to sum all the natural numbers counting by, say, 27? With the 68000, we just change the first Muls operand to 27. On the 6502 we would have to rewrite the loop, or code a complicated multiplication algorithm.

No subroutine is complete until it returns to its caller. Like the 6502, the 68000 does this with the RTS instruction. But unlike the 6502, the 68000 has different ways of getting to the subroutine in the first place: JSR (Jump to SubRoutine) and BSR (Branch to SubRoutine).

JSR operates on any address, and BSR operates on a 16-bit signed displacement—just like the branch instructions discussed earlier. No matter which instruction is used, control is returned with the same RTS instruction.

I hope this short program shows you how easy it is to program in 68000 assembly language, and how similar the 68000 actually is to the 6502. Although my article stressed the differences between the two chips, any dabbler in 6502 assembly language will have no trouble learning the intricacies of the 68000.

*Chris Chabris used to be a very active writer for Antic, but this is the first article he's had time to work on since entering Harvard University as a computer science major last fall.*

## BOOK LIST

### **M68000 16/32-bit Microprocessor Programmer's Reference Manual**

(Fourth edition)

by Motorola.

Prentice-Hall, 1984

Englewood, NJ

### **Motorola Data Sheets:**

68000—#AD1-814

68008—#AD1-939

68010—#AD1-942

### **Programming the M68000**

by Tim King and Brian Knight

Addison-Wesley, 1983

Reading, MA

### **The Motorola MC68000 Microprocessor Family**

by Thomas L. Harman and Barbara Lawson.

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Englewood Cliffs, NJ

### **68000 Assembly Language Programming**

by Kane, Hawkins, and Levanthal

Osborne/McGraw-Hill, 1984

Berkeley, CA

### **The 68000: Principles and Programming**

by Leo J. Scanlon

Howard W. Sams & Co., 1984

Indianapolis, IN



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# ST LOGO EXPLORATION

## Mapping uncharted memory

by FRED HATFIELD

When you buy a computer that's too new to have detailed technical documentation available, it's up to you to find out whatever you can about the internal features. The Atari 520ST comes with two manuals. One is an attractively illustrated users guide that gets you started with the drop-down menus and selection of optional features, etc. The second manual is entitled "Sourcebook for Atari Logo" and describes technical features of Logo, the only language currently provided with the ST.

One of the tried-and-true approaches for exploring an undocumented computer is to find some way of looking at memory storage locations. Once you can look at memory, the "brute force" method of figuring out what's going on is to print out the biggest possible hexadecimal dump of memory you can manage. Then you sit down and look for obvious patterns, I/O control blocks, object code, messages, etc.

While scanning the Logo sourcebook, I noticed a primitive called `.EXAMINE n` that displays contents of absolute memory location `n` as specified by the input number. Terrific! There should be a matching `.DEPOSIT n` and sure enough there was! Now we could look for the best spots in the "fishing hole."

By experimenting, I discovered the `.EXAMINE n` limits were between `$00800` and `$7FFFF`. (No, that's not an extra F—you're working with 24 bits now.) I won't worry about that yet, I thought. All I want *now* is a "quick and dirty" way to read and print out memory

A simple loop finds that you can enter two addresses for start and stop locations and get data out:

```
TO DUMP :START :STOP
IF (:START >= :STOP) [STOP]
[TYPE .EXAMINE :START TYPE [# ]
DUMP :START :STOP]
END
```

A more useful format would consist of the address followed by 16 successive byte values, as is the case with most standard dump formats.

Since Logo is more suited for graphics, it began to look as if necessary arithmetic routines (such as binary to hex conversion) would consume too much programming time.

### LOGO HEX

Once again I thumbed through the ST Logo Sourcebook. This time I discovered a way to convert binary to hex by string substitution instead of by arithmetic. After all, we're only working with 256 possibilities, so a string substitution table doesn't take up too much of a 512K memory.

Sure enough, there was an operation called `PIECE` which was just perfect for what I wanted to do. A previously defined string could be used for supplying the desired two hex digits in ASCII. The value of the memory contents would define the decimal position of the two-character ASCII pair desired.

I immediately built two strings, one called :HEX1 and the other :HEX2 (clever, no?). :HEX1 had the string value "000102030405 . . . 7D7E7F" and :HEX2 had the rest of the combinations, "80818283 . . . FDFFEF", like so:

```
?TO INIT1
>MAKE "HEX1 "0001020304
05060708090A0B0C0D0E0F1
01112131415161718191A1B
1C1D1E1F202122232425262
728292A2B2C2D2E2F303132
333435363738393A3B3C3D3
E3F40414243444546474849
4A4B4C4D4E4F50515253545
5565758595A5B5C5D5E5F60
6162636465666768696A6B6
C6D6E6F7071727374757677
78797A7B7C7D7E7F"
>END
```

Now let's test it by outputting an actual two-character string just as we would want to do with the finished program.

We'll call it PRNT1 since it prints all values from 00 to 7E, depending on the value of the two decimal digits following the PIECE command:

```
TO PRINT1 :A
MAKE "HCHR PIECE :A+1 :A+2 :HEX1
TYPE :HCR
END
```

Then, when you test it by typing PRNT1 32 [RETURN] it responds with:

```
20
?
```

These are the 33rd and 34th characters in the :HEX1 string—and also the hex representation of 32 decimal.

Now the remaining job is to design a procedure that calls the proper PRNT routine, depending on the value of the input variable :A. This means testing :A on entry and determining if its value is above (80 hex—128 decimal) and then calling the proper PRNT routine. Since the positions in :HEX2 are the same as :HEX1, we can compensate by subtracting 128 from all values equal to or greater than 128. The only difference between :HEX1 and :HEX2 are the contents of the strings stored there—:HEX2 values are 128 higher, but in the same relative positions as :HEX1 values.

## PRNT CALL

Since the strings are *two* characters for every value, the input value :A will have to be multiplied by two somewhere. Why not do it at the beginning of the routine where we test the value above or below 128? Then you won't have to worry about it afterwards. All we have to do is double it immediately, then double the test for above or below 128—so now we test for values above or below 256.

In the end, for reasons of modularity, I broke up the strings into 8 groups of 64—:HEX1 through :HEX8, each containing 64 two-digit representations of hex values.

When the input routine PRNT receives the decimal value to be printed in hex (:B), it also receives a character count (CNT) indicating how many two-character hex representations to put on a line. The version here is 16 since that is an easy number to step in hexadecimal and the memory map representation is neater and easy to use. 16 characters to the line will also leave enough blank space on the right hand margin to make notes and draw identification arrows with copious valuable (hopefully) information.

However, if you should desire to cut your paper consumption in half by putting 32 characters to the line (or even 64 in compressed Epson print) it is easy enough to change the 16 value passed by DUMP into the value desired. But *don't* forget to also change the address incrementing value following the PRNT call. Otherwise, your address identifications on the first line will still be incremented by the previous value.

A note about PRNTZ. Each PRNT routine converts the requested decimal value to a two-character hex representation. That value is stored in variable :HCHR (Hex Character). It may appear that this is wasteful, since the value could be printed immediately at conversion. But by storing it in :HCHR, later versions of the dump will be able to perform smarter functions such as disassembly, memory searching, etc.

Programmers usually call this a "hook" for possible later features. So when the data has been converted by the proper PRNT routine, all branch to the common PRNTZ location where :HCHR is printed to the screen or printer. When control returns to PRTLIN9 (in routine PRTLIN2), there is a command to PRINT [ ]—which is really there to supply a carriage return/line feed. In the Epson buffered printer, a line is not printed until CR/LF is received, so this simply causes the 16 double characters just sent to the line printer or screen to be displayed.

## TYPING IT IN

So to start exploring your ST's memory with Logo, type in Listing 1, DUMP.LOG. Be sure to type INITALL before you RUN the memory dump.

The program is stopped by pressing [CONTROL] [G]. If you just want to pause, press [CONTROL] [Z]. Type CO to continue everything from where it left off.

I discovered that this program is slow enough so that any additional tinkering might bring it to a discouraging crawl. I usually started it in the evening and let it run all night. The beginning of any computer system analysis is going to be slow and monotonous. But once you have developed this primitive tool you'll see some rapid gains.

*Fred Hatfield is a New Orleans programming consultant. He wrote Reader's First ST Program in last month's Antic.*

Listing on page 94



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Type **DIR** [RETURN] to see an alphabetized **DIR**ectory of files. If you have more than one drive, place the number of the drive directory you wish immediately after the command: **DIR2**.

Once a disk drive number is specified, that drive becomes the "default" drive. For example, after typing **DIR2**, all commands—including **DIR**—will affect drive 2.

By adding a **/P** (slash P) after the command, you can send the directory of any drive to a printer. You may also specify a filename: **DIR3/P\*.OBJ** will send all files on drive 3 with **.OBJ** extenders to the printer as well as to the screen.

## FORMAT

**FORMAT** will format the default drive. You may format another drive by placing the drive number immediately after the command. A disk in a 1050 drive defaults to enhanced density under DOS 2.5. Should you wish to Force the format to single density, type **FORMAT/F**. As with most **DISKIO PLUS** commands, you will be prompted to verify this command by pressing [Y]. (Old-time **DISKIO** users should note there will be only *one* prompt).

## DOT COMMANDS

Five of the one-dot commands use identical parameters to the **.K** lock command described above. They are: **.U**, Unlock; **.S**, Save; **.E**, Enter; **.L**, Load; **.R**, Run. In each case, you may specify the filename, or the device and filename. If the directory is showing, you can also specify the file reference number.

Use **.N** to reName files. This is a little different from other dot commands because it requires you to enter a new name for your file. The filename parameters, however, are identical to other dot commands, followed by a space and the new filename. For example:

**.N6 NEWFILE.TXT.**

**DISKIO PLUS** will not allow you to create duplicate files. Since the directory is alphabetical, you should re-list it after renaming a file because the files may now be in a different order with altered reference numbers.

To **LIST** a file to the disk, use the **.X** command. With this command, you may also specify starting and ending line numbers. Should you wish to **LIST** a file from a particular line number to the end of the file, sandwich the line number with commas: **.X7,360,.**

You may **LOAD** Binary files from **DISKIO PLUS** with the **.B** command. No check is made to see what the Binary file might write over, so this could cause a crash. Should you wish to **LOAD**—but not **RUN**—the Binary file, append **/N** (slash N) to the command. If the file specified is not Binary, the **LOAD** will be aborted.

## MOVE COMMAND

The Move command has many options, but we're always Moving a file, or files, from a "source" to a "destination."

Let's look at some examples. To Move reference-numbered 6 file from drive 1 to drive 2, where drive 1 is the default drive: **.M6/2**. You can also type:

**.MMYFILE.BAS/2**

or **.MMYFILE.BAS D2:MYFILE.BAS.**

You can change the destination filename:

**.M6 D2:NEWFILE.BAS**

or **.MD2:MYFILE.BAS D:NEWFILE.BAS.**

As previously mentioned, you can use wild cards on file Moves: **.M\*.OBJ/2**.

When using a single disk, you will be prompted to insert your source and destination disks. These prompts will also work with wild-card multiple file Moves.

By adding **/S** or **/P** to the Move command, you may Move the chosen file to the screen or printer. **.M6/S** Moves file #6 to the screen. **.MMYFILE.LST/P** prints the BASIC file, **MYFILE.LST** to the printer.

Naturally, only a text file or **LIST**ed file will make much sense. But you can disable screen control characters during a screen print by adding 1 to the **/S** extender: **.MTREE.PIC/S1**.

## TURNING IT OFF

Caution! **DISKIO PLUS** can get in the way of string input in BASIC programs. While inputting a string, **DISKIO PLUS** will act upon any input that can be interpreted as a **DISKIO PLUS** command.

For example, suppose your program prompts you for input and you type in **DIR** while **DISKIO PLUS** is active. **DISKIO PLUS** will print a **DIR**ectory.

Luckily, it's easy to get rid of **DISKIO PLUS**. Type **OFF** to disable it, and type **ON** to bring it back. Type **OFF** and press [RESET] to permanently disable **DISKIO PLUS**.

[SYSTEM RESET], by itself, will not affect **DISKIO PLUS**.

You may also disable **DISKIO PLUS** from your program by **POKE**ing location 10592 with a 255. **POKE** the same location with a zero to turn it back on.

**DISKIO PLUS** takes up some of your RAM and there are times when you need all the memory you can get. To get full memory, permanently disable **DISKIO PLUS**, as described above. Type **DOS**, then return to your cartridge. (Note: this will not work if you are using **MEM.SAV**).

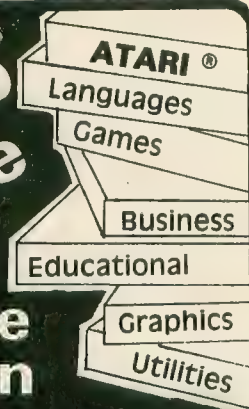
## SPECIAL OPTIONS

**BASIC XL** has a command I've always liked, so I added it to **DISKIO PLUS** so other languages could use it. **LIST**, or **L**, followed by a line number and a comma, will **LIST** the resident program from that line number to its end. Otherwise **LIST** will function identically to the Atari BASIC command.

You may write whichever DOS is resident to disk by typing **WDOS**. If you wish to write to other than the default drive, follow the command with a drive number.

This function will not work with **DOS XL**. Also, **DISKIO**

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PLUS will not work with the supercartridge version of DOS XL.

DISKIO PLUS allows you to create as many as three single-key macros.

Let's say we're getting tired of constantly typing PRINT #6;. Instead, we type:

**DEF1 P PRINT #6; [RETURN].**

Now, whenever [P] [RETURN] is pressed, our phrase will be printed to the screen. Anytime after defining a macro, type **HELP** and your macro will appear on the screen. You may edit the macros directly on the **HELP** screen.

Your macros can call other macros, or call DISKIO PLUS commands. **DEF3 D DIR8**, will call the RAMdisk directory on the 130XE whenever [D] is pressed.

Macros are limited to 30 characters, and you can use control characters—but not special control characters such as the screen-clear symbol. Also, the macros are not case-sensitive. Though you may enter key-command and the characters in inverse or lower-case, macros will reappear in normal, upper-case.

You can replace existing macros by redefining them. If you wish to completely delete a macro—DEF1, for example—type **DEF1 [SPACE] [ESC] [ESC] [RETURN]**.

## MACRO FILE MAKER

Listing 2 is a BASIC program which will save any currently defined macros into a one-sector binary file which can be loaded into memory with the **.B** command. This way you can create any number of macro files and instantly load them as needed.

Type in Listing 2, KEYMAC.BAS, check it with TYPO II and SAVE a copy.

Now, create some macros and make sure they're on the HELP screen. RUN Listing 2 which will ask for a filename. Device is optional. An extender of .KEY will be automatically added.

Now, whenever you boot DISKIO PLUS, all you have to do to create your macros is load the .KEY file with the **.B** Binary load command.

Note: Listing 2 will disable DISKIO PLUS during its run, so if you press [BREAK], don't press [RESET] until you've turned DISKIO PLUS back ON.

## REMINDERS

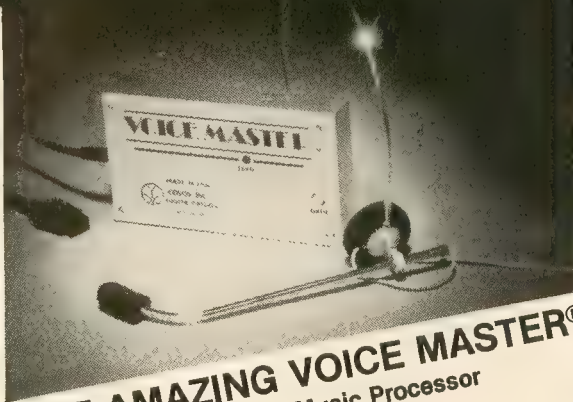
Remember, DISKIO PLUS commands will react from BASIC string input. So will macro commands—so if you're getting strange results from a BASIC program, turn DISKIO PLUS to OFF.

Also, DISKIO PLUS takes up some of your RAM. If you receive an ERROR 2—Out of Memory, you may need to get rid of DISKIO PLUS as described above, in Turning It Off.

Listing on page 86



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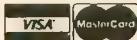
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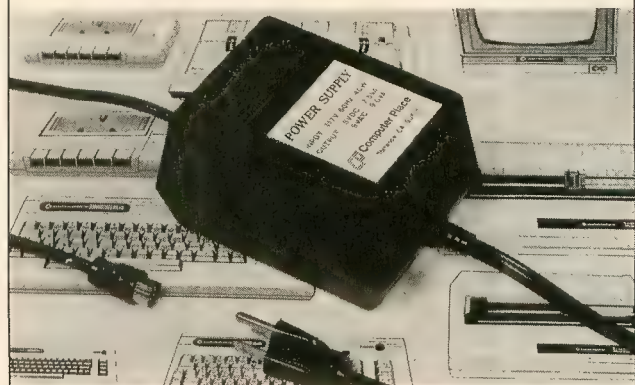
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### Feature Comparison Chart

|   | OMNIMON<br>Piggyback<br>400/800 | Ramrod<br>OS board<br>800 | -----Upgrades for-----<br>---OMNIMON or Ramrod--- |         |         | Ramrod XL Add-on for<br>Piggyback Ramrod XL |
|---|---------------------------------|---------------------------|---|---------|---------|---|
|   |                                 |                           | 8K OMNI   | 8K VIEW | 4K VIEW | 800XL<br>VIEWXL/XE                          |
| Enhanced OS                                     |                                 | ★                         |   |         |         | ★   |
| Includes FASTCHIP FP                            |                                 |                           |   |         |         | ★   |
| 80 Column Emulation                             |                                 |                           |   | ★       |         | ★   |
| Ramdisk Handlers                                |                                 |                           | ★   | ★       | ★       | ★   |
| OMNIMON Features:                               |                                 |                           |   |         |         |   |
| A: Alter Memory                                 | ★                               | ★                         | ★   | ★       |         | ★   |
| B: Boot (Ram) disk                              |                                 |                           | ★   | ★       | ★       |   |
| C: CPU Registers                                | ★                               | ★                         | ★   | ★       |         | ★   |
| D: Display Memory                               | ★                               | ★                         | ★   | ★       |         | ★   |
| E: Single Step Execution                        | ★                               | ★                         | ★   | ★       |         | ★   |
| F: Fill Program Buffer                          |                                 |                           | ★   | ★       |         | ★   |
| G: Binary Load/Directory                        |                                 |                           | ★   | ★       |         | ★   |
| H: Hex Conversion                               |                                 |                           | ★   | ★       |         | ★   |
| I: Hex Arithmetic                               |                                 |                           | ★   | ★       |         | ★   |
| J: Install Ramdisk Handlers                     |                                 |                           | ★   | ★       | ★       |   |
| K: Jump Subroutine (JSR)                        | ★                               | ★                         | ★   | ★       |         | ★   |
| L: Drive Selection/Control                      | ★                               | ★                         | ★   | ★       |         | ★   |
| M: Move Block of Memory                         |                                 |                           | ★   | ★       |         | ★   |
| N: Relocate 6502 Code                           |                                 |                           | ★   | ★       |         | ★   |
| O: Operate from Prog. Buffer                    |                                 |                           | ★   | ★       |         | ★   |
| P: Printer Control                              | ★                               | ★                         | ★   | ★       |         | ★   |
| R: Read Sector(s) from Disk                     | ★                               | ★                         | ★   | ★       |         | ★   |
| S: Search Mem. for Sequence                     | ★                               | ★                         | ★   | ★       |         | ★   |
| T: Tog. Hex Char Display Mode                   | ★                               | ★                         | ★   | ★       |         | ★   |
| U: User's Custom Command                        |                                 |                           | ★   | ★       |         | ★   |
| V: Verify 2 Blocks of Memory                    |                                 |                           | ★   | ★       |         | ★   |
| W: Write Sector(s) to Disk                      | ★                               | ★                         | ★   | ★       |         | ★   |
| X: Disassemble Memory                           | ★                               | ★                         | ★   | ★       |         | ★   |
| Y: Line Assembler                               |                                 |                           | ★   | ★       |         | ★   |
| Z: Exit Monitor                                 |                                 |                           | ★   | ★       |         | ★   |
| Lockup Recovery                                 |                                 |                           | ★   | ★       |         | ★   |
| Redirection of Printer I/O                      |                                 |                           | ★   | ★       |         | ★   |
| Talk to Happy Ram Buffer                        |                                 |                           | ★   | ★       |         | ★   |
| 80 Column ATRMON for<br>Includes SpeedScript 80 | ATR8000                         |                           |   |         |         | ★   |

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## Free OMNIVIEW for your 400/800!

OMNIVIEW has been steadily gaining in popularity, especially since the introduction of SpeedScript 80 (see left column of this ad). CDY now makes beautiful 80 column screen output even more affordable by providing a 4K OMNIVIEW (including SpeedScript 80) free of charge with every OMNIMON piggyback board sold! And since this OMNIVIEW also has resident ramdisk handlers, it is especially powerful in conjunction with the AXLON Rampower 128, allowing you to interface it with almost any DOS. However, OMNIMON piggyback boards are in limited supply, so order soon to take advantage of this great opportunity. Remember, Christmas is right around the corner! Avoid the rush!

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# BUILD YOUR OWN EPROM BURNER

*Chip programming for \$30*

by LARRY WOODGEARD and CHARLES CHERRY

*With a little over \$30 dollars in parts, some careful wiring, and this assembly language program, you can build your own EPROM burner. The project requires an intermediate knowledge of circuit-building and an intermediate to advanced knowledge of machine language. Besides the parts listed in the article, you will need the Atari Assembler Editor, or MAC/65, and some form of debugger.*

*The following article assumes a sophisticated knowledge of hardware and assembly language. We have taken every step to ensure that the information contained herein is correct, but Antic cannot take responsibility for, nor give assistance on, readers' hardware projects.*

—ANTIC ED.

## EPROG

by Larry Woodgeard

EPROG (EPROM Programmer) is designed to read or program three popular types of EPROMs: 2716, 2732, and

2764. It consists of an assembly language program and hardware circuitry, and it works out of joystick ports 1 and 2.

The majority of the EPROG circuitry (see *Figure 1*) consists of IC1 thru IC8 which are 4-bit tri-state D-latches. Port 1 does data transfer 4 bits at a time. The 4 bits of Port 2 are used as control signals. IC9 is used as a buffer and signal inverter. The five mode switches SW1 thru SW5 are

used to select programming requirements for the three different devices. We also need a power supply to provide +5 volts and +22 volts.

## MODES OF OPERATION

There are two modes of operation: Read and Program. The Read mode allows you to read the EPROM into an assigned memory location in the computer. The Program mode lets

*continued on next page*

## WHAT'S AN EPROM?

EPROM stands for Erasable Programmable Read Only Memory. Just like the ROM (Read Only Memory) chips in Atari cartridges, an EPROM does not lose its data when the power is turned off. Unlike ROM chips, EPROMs can not only be programmed, they can be *erased* and re-programmed.

Putting a program on an EPROM is sometimes called "burning." And the hardware that does the job is referred to as an "EPROM burner." The following article will examine how

to build an EPROM burner—called EPROG—and how to transfer machine code to the EPROM chip.

The great thing about EPROMs is you can program them to make customized operating systems or cartridges—and load instantly when you boot your Atari. As already explained, EPROMs can be erased and re-used. You erase the EPROM by exposing the little window on top of the chip to Ultra-Violet light for about 20 minutes.

you write data into the EPROM from a selected memory location.

To perform a Read, the ports are first set to an output mode. Then the EPROM must be given the address, enabled, and the data is read into the port. Each address is broken down into 4 nybbles. The highest nybble of the address is presented to port 1 and IC1. Then a clock pulse is applied to all the registers shifting the nybble through IC1. The next highest nybble is then shifted through the same way. Four of these shifts result in the complete address in IC1 thru IC4.

Now, the 4 bits of Port 1 are changed to input mode. A high is applied to RW1 which serves to disable IC1 thru IC6, enable IC7, and enable the EPROM. RW2 determines which nybble of the data is presented to Port

1. With RW2 low, the low nybble of the data is read into the computer. Taking RW2 high disables IC7 and enables IC8 allowing the high nybble to be input to the computer. This completes one cycle of the Read.

In Program mode the actions are simpler. The program sets the ports to output mode. The switches are set according to which EPROM you're programming—to apply the necessary programming voltage and chip enable (Ce) to the proper pins.

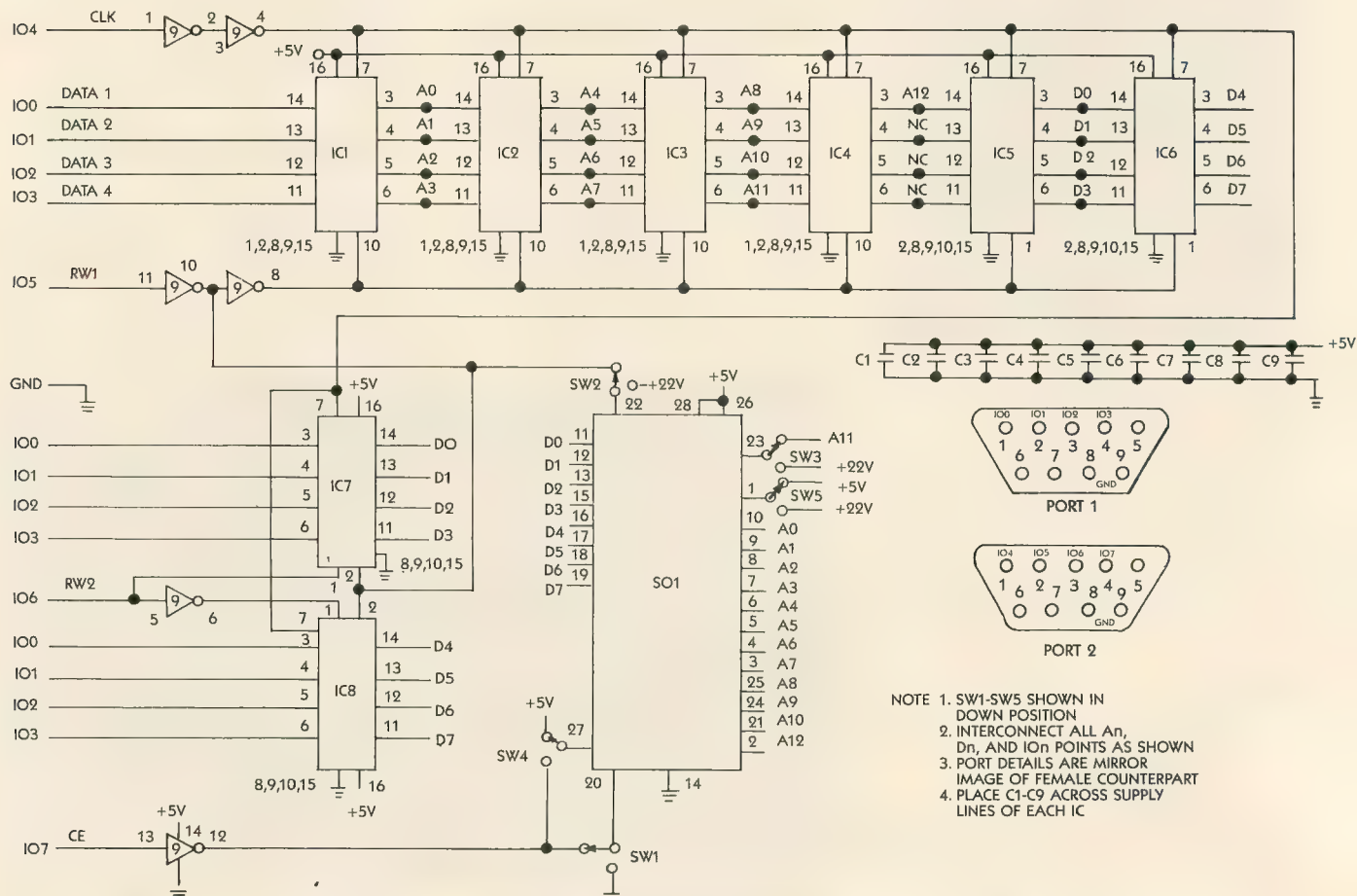
IC7 and IC8 are not used. IC5 and IC6 hold the low and high nybble of the data to be written to the EPROM in the same fashion as the address registers were used. The high data nybble is shifted in first, followed by the low data nybble, then the high nybble address and so on. Six shifts

put the address and data in IC1 thru IC6. The programming pulse is then applied to Ce input. The data in IC5 and IC6 is burned into the address in IC1 through IC4.

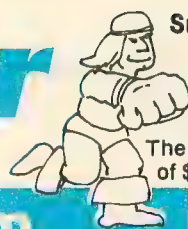
The programming pulse is 50ms long for the 2716 and 2732. This makes the total programming time several minutes. The 2764 uses 1ms programming pulses and is accomplished in about 30 seconds. A Read can be performed after the EPROM is programmed to verify the data is correct.

Should you decide to rewrite the program, do not put the 4 bits of Port 1 in the output mode and make RW1 high under any circumstance, because this will be trying to input and output to Port 1 at the same time.

continued on page 72



# Atari Power

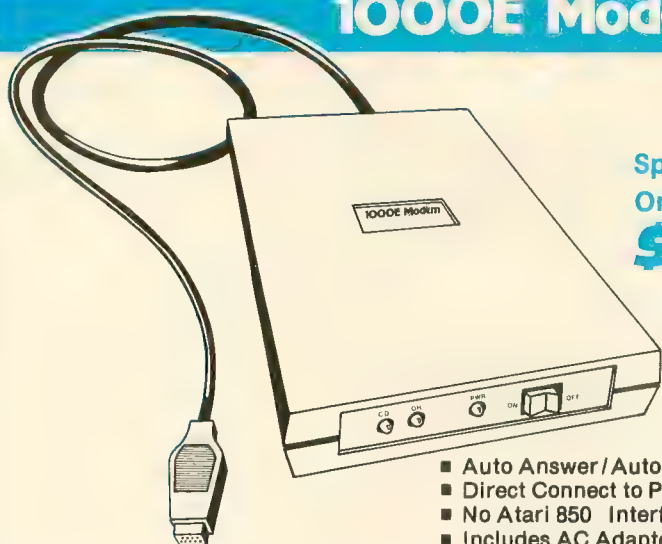


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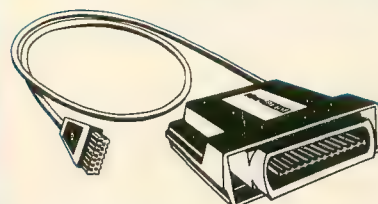
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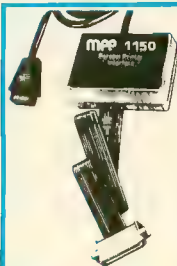
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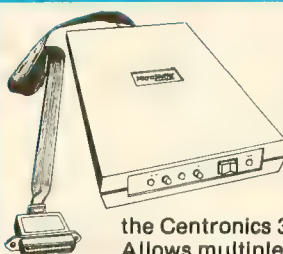
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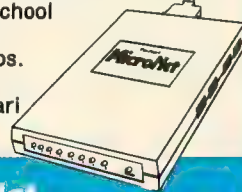


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ASSEMBLY LANGUAGE  
continued from page 70

## BUILDING AND USING EPROG

by Charles Cherry

*When Antic received EPROG, we knew immediately we wanted to publish it. We were sure it functioned properly for its designer, Larry Woodgeard, but we wanted to make sure our readers could build and operate it. We asked Charles Cherry, whom we knew to have the technical background for this kind of project, to build the EPROG from scratch and describe his experience—and the pitfalls. —ANTIC ED.*

The first thing you should notice about this project is that it plugs into the wall. This means dangerous voltages are present so it should be built and used with proper caution.

The second thing to note is there are no buffers or isolators between the EPROG and your Atari. So when you get it assembled and are ready to test it for the first time, you might unplug your RAMdisk, 80-column card and other custom hardware. Chances are everything will work fine, but if you make a mistake you could damage the computer.

## GETTING THE PARTS

The EPROG hardware can be built on a breadboard, but for greater permanence, I chose a perf board. All parts except the chips and the ZIF (Zero Insertion Force) socket are available from Radio Shack. (Radio Shack part numbers are in parentheses on the Parts List—See Figure 3.).

The chips and socket can be obtained from most mail order companies (e.g. Jameco Electronics, 1355 Shoreway Road, Belmont, CA 94002). You can save a whole lot of money if you shop around for the parts. I was in a hurry so I spent about \$60. You should be able to cut that in half.

This was the first IC project I ever built without a printed circuit board. I hope you can learn from my mistakes. Since I had no wire-wrap experience or tools, I decided on point-to-point soldering using some 22-gauge wire I had in my kit. A big mistake. It can be done, but it ain't easy. When I got finished, the thing did not work.

So I rebuilt it using wire wrap. It still did not work, but it was easier to check the wiring.

After hours of brain numbing trouble-shooting, designer Larry Woodgeard, discovered that the slide

switches I had scrounged were make-before-break types and they blew the chips during switching.

Pitfalls 1 & 2: Use wire wrap, and be certain that you use break-before-make switches.

## THE SCHEMATIC

Study the schematic (Figure 1) carefully before you lay out the board. Notice that the wires from joystick port 1 go to IC1 and the wires from joystick port 2 go to IC9. Look at the way IC9 (which is scattered around the schematic) is connected. Note that IC9 is a CMOS chip and must be handled with appropriate safeguards against static discharges.

Install the sockets and switches, but do *not* install the chips until the circuit has been tested. If you're smarter than I was, you'll get some of those labels which slide onto the sockets and identify the pins. Lay in the +5V and ground busses and connect them. Then install capacitors C1—C9 as close as possible to the power supply pins on the ICs.

Now, methodically connect all the pins, starting with IC1—be sure to check and recheck each hookup. Notice that pin 8 on IC9 connects to pin 10 on IC1—IC4, but it connects to pin 1 on IC5 and IC6. Conversely, pin 1 on IC1—IC4 and pin 10 on IC5 and IC6 go to ground.

Be very patient and don't try to do it all in one sitting. Use a low wattage iron (25 W or so), the smallest tip you can find, and your best technique. If you have trouble translating the diagram into real circuits, find someone who can read schematics to help you. It can be very difficult to trouble-shoot an IC circuit, so take the time to get it right the first time.

## WHERE THERE'S SMOKE...

When you have wired the EPROG, install the power supply (see Figure 2). Any supply which delivers +5VDC

continued on page 74

Figure 3

### PARTS LIST

IC1-IC8 ..... SN74LS173  
IC9 ..... MM74C14N  
SW1-SW5 ..... SPDT SWITCHES (275-625)  
C1-C9 ..... 0.1MF CAPACITORS (272-1069)

#### MISCELLANEOUS

8ea 16 PIN WIRE-WRAP SOCKETS (276-1998)  
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etc .....

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IC10 ..... 317T IC REGULATOR (276-1778)  
IC11 ..... 7805 IC REGULATOR (276-1770)  
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**OPERATION:** The "IMPOSSIBLE" consists of a disk program (**unprotected** so you can make as many backups as you wish) and a 4K STATIC RAM pack which is inserted into your computer (no soldering!) The "IMPOSSIBLE" will read your program disk and then **re-write it in an unprotected format!** You may make additional backup copies using a sector copier or even regular DOS! Because your backup copy no longer has **BAD SECTORS** or **EXOTIC FORMATS**, the program data can now be manipulated into DOS compatible files (even double density!), transferred to cassette, etc. (with the aid of our Satellite programs!) No user programming knowledge required. A few programs require logical thinking.

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**REQUIREMENTS:** The "IMPOSSIBLE" diskette, the 4K STATIC RAM pack, a 400 or 800 computer (please specify!) with 48K and "B" Rom's. NOTE! The very old ATARI computers were shipped with "A" Rom's which had some serious "Bugs". Even if you don't own an "IMPOSSIBLE," you should upgrade to "B" Rom's (simple to install!) We have them available at a very inexpensive price. CALL US! "XL" version available soon!

**NOT A PIRATING TOOL:** We at C.S.S. did not design The "IMPOSSIBLE" to put Software Manufacturers out-of-business overnight! Nearly all of our products have been "ripped-off" by industry parasite who have little or no ability to develop a product of their own so we can sympathize with their dilemma. All C.S.S. products have built-in safe guards which prohibit their use for flagrant pirating. The "IMPOSSIBLE" is no exception! While The "IMPOSSIBLE" back-up the most heavily protected programs, it also checks to see that the 4K STATIC RAM pack is installed before allowing the backup copy to execute!

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## ASSEMBLY LANGUAGE

continued from page 72

@ 300 ma. and +22VDC @ 100 ma. will do. The diagrammed one is simple and works. You will need a voltmeter to adjust the output by tweaking R3.

When you get the proper voltages, connect the power supply to the EPROG circuitry. Then power up and let it run for a while. Flip all the switches to see if anything heats up or smokes.

Everything okay? Turn off the power and double-check your wiring one more time. Now, flip all the switches down and install the chips. Again be careful with IC9—it's a CMOS, so be sure and ground yourself to avoid stray static. Put in an EPROM, turn the power on—without plugging into your computer—and check for hot ICs or smoke. Flip all the switches again. If it still seems okay, plug in the Atari and run the program. Good luck!

## BURNING THE CHIP

The EPROG software is designed to program the EPROM from code in a fixed buffer and to read the EPROM back into the same buffer. Buffer location depends on the type of EPROM

used. The buffer for the 2716 is \$8800 to \$8FFF, the 2732 buffer is \$8000 to \$8FFF, and the 2764 buffer is \$7000 to \$8FFF.

EPROG must be used with a debugger or monitor, so after you've typed in, assembled, and created your object file, use your debugger to load EPROG and type "Go \$6000".

The program will prompt you for chip number, read or write, and switch configuration. Following the screen prompts, read the EPROM, then return to the debugger and display the EPROM buffer area. If the EPROM is unprogrammed (or erased) the buffer will be all FFs. If the EPROM has not been erased, it cannot be programmed. Either replace it, or erase it with ultra-violet light, as mentioned previously.

Load or relocate the code you want to burn onto the EPROM. When the code is in the proper buffer call EPROG again with "Go \$6000" and program the chip.

My debugger is BUG/65, from Optimized Systems Software, and I had to make one modification. The EPROG program cycle ends with a BRK instruction. Most debuggers re-

gain control at this point, but not BUG/65. Instead I changed the final instruction to RTS and used "U 6000" (user) to call EPROG.

## MAKING CARTRIDGES

When venturing forth into new territories it is always wise to get an expert guide. So I went over to American TV (15338 Inverness Street, San Leandro, CA 94577) for advice about making cartridges. The Atari 16K cartridge uses ROM chips which are compatible with the 2764. All you have to do is plug your EPROMs into the sockets.

However the 8K Atari cartridges were designed for 2532 compatible ROMs, which EPROG cannot program. Luckily, there are modification boards for these cartridges which allow you to use 2732s. American TV has all of these cartridges, boards, kits and instructions available.

If you want to delve into the mysteries of operating system modification, the people to contact are Newell Industries (3340 Nottingham Lane, Plano, TX 75074). They make the RAMrod board which will take 2732 EPROMs on the Atari 800 and 400. However the XL/XE RAMrod board uses 27128s. If you have an XL/XE you will have to fabricate your own EPROM board.

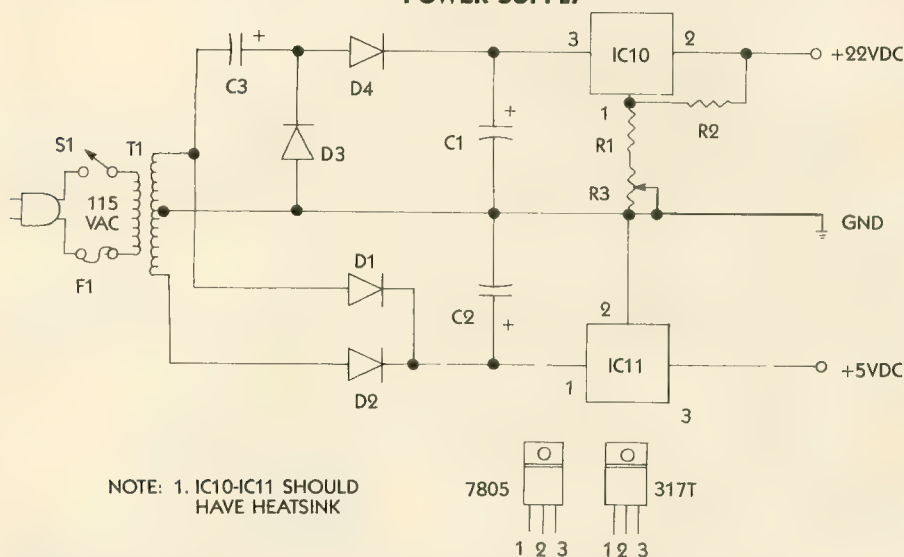
This is an exciting and challenging project. If you are experienced with digital circuits or can find someone to assist you, give it a try.

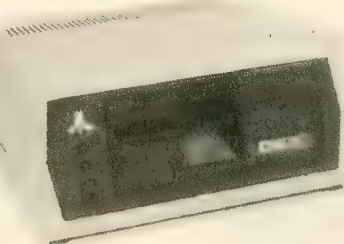
Listing on page 89



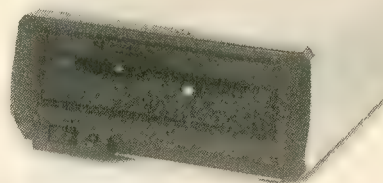
Figure 2

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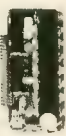
ROM



CPU



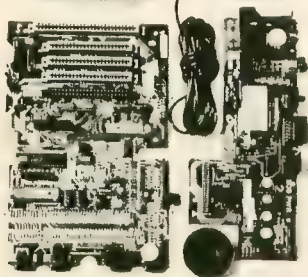
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De Re ATARI (All About ATARI) \$15, tells you everything you want to know about the ATARI 400 and ATARI 800 Home Computers, but were afraid to ask. It's an excellent resource and training text for professional programmers who use ATARI Home Computers and for advanced hobbyists who understand ATARI BASIC and assembly language. Neither an introductory manual nor a reference for the computer, De Re ATARI explains the concepts behind the internal structure of the ATARI Home Computer.

Topics include graphics indirection, player-missile graphics, display list interrupts, scrolling, sound, the Operating System, the Disk Operating System, ATARI BASIC and CTIA. Extensive appendices, sample programs, display screens, and diagrams generously illustrate the discussions. A glossary defines and explains some less commonly encountered terms.

An added feature is a laminated Programmer's Card containing the most needed facts and figures about the computer.

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# PROBURNER

*Best EPROM burner on the market*

Reviewed by IAN CHADWICK

**W**hy burn your own chips? For one thing, cartridge software loads and runs faster and easier. It also enables you to customize your operating system to suit your special needs.

However, burning chips—EPROMs or EEPROMs—is not something that most amateur programmers tackle. It's generally expensive, difficult and unforgiving. Also, the variety of EPROMs that can be programmed by most devices available is less than encouraging—too many are simply left out for one reason or another.

The Thompson Electronics **Proburner** now changes all that. It is an excellent buy for the versatility and ease of use that it offers. This EPROM burner fits into the cartridge slot of an Atari XL or XE computer. Control software is built in and so is the chip socket itself (a low insertion-force socket rated for 10,000 insertions). There's no need to hook up an 850 or load disk files first. But XE owners will quickly come to hate their cartridge slots on the back of the computer, since it makes chip insertion awkward and somewhat chancy.

The Proburner can read and write a wide range of 26-pin and 28-pin chips from 2K to 16K, including the 2716, 2732, 2764 and 27128 EPROMs as well as the 2816A, 52B13, 52B23 and 52B33 EEPROMs. It can also read



2K to 8K ROMs into memory and store the cartridge itself, using the burner as its own tester to see if your efforts worked.

## EPROM BASICS

EPROMs can be erased with a strong ultraviolet light. Many electronic magazines have run stories explaining how to build an eraser using a medical UV sterilizing lamp for under \$25. EEPROMs can be erased electrically. It's obviously easier, but EEPROM chips cost at least twice as much as EPROMs.

EPROMs are not necessarily pin-compatible with your computer or with the chips in your cartridges. (The OS ROM chip in the Atari XL/XE series is a compatible 27128.) You can read these chips with the Proburner, but you need a socket designed for an

EPROM when you burn your code back into such a chip. Many third-party cartridges use EPROMs—Monkey Wrench and MAC/65, for example. Cannibalizing your unused carts is one simple method of obtaining the sockets.

## OPERATIONS

Proburner's selection of software commands is slim; load and save a file to disk (using DOS, which overwrites code in low memory), cassette, copy, burn-in, verify or run from chip, erase check and transfer to DOS. There is also a monitor which can display, change, print or move a section of memory.

There is no method of reading disk sectors, assembling or disassembling memory—features I would prefer instead of the cassette I/O. However, I found I could go to DOS and load my own monitor program into low RAM. Then I could return to the cartridge and run it from there, or jump to the cart from the monitor. This gives me the ability to disassemble code before I try to change it.

The Proburner code itself takes up \$8000 to \$8FFF and seems to be duplicated between \$9000 and \$9FFF. That's a 4K duplication and, unless there is some good reason for it, the space could be better used by a disassembling monitor or a miniassembler. Running the burner from either start

location seems to produce the same results. If the Proburner wasn't so completely sealed in epoxy, I would take out the software chips and reburn one of the duplicate areas with my own software instead.

## FINER POINTS

Many factors must be considered before you try to burn a chip. I planned to copy the XL/XE OS chip into RAM, save it to disk, delete the useless self-test code, replace it with my monitor program, change the startup colors, reverse the [OPTION] key toggle to activate BASIC when held down, fix the printer timeout bug, tamper with the floating point routines—and then write the whole 16K back into a 27128 chip.

However, Proburner saves memory to a disk file via the DOS binary save command. And loading DOS writes DUP into memory—up to \$3306. So I over-wrote my carefully moved and edited ROM code. Sigh. There is enough room to fit all of the OS code

into free RAM above DUP and not over-write it. But it's a consideration you must prepare for in advance.

If you aren't used to burning your own chips, I suggest you start slowly. Try a 2K or 4K EPROM before tackling a larger project. It's easier to erase and reburn, although burn time itself is only a few minutes. Learning to burn your own chips isn't really difficult. But because so little written help can be found anywhere, you must figure out a lot of the finer points by trial and error.

The Proburner has several built-in safety routines, such as a timer to wait while the cart sets up its internal hardware necessary for burning. There's also an automatic erase check-and-verify when burning an EPROM.

The instructions on inserting and reading a chip are well enough explained to be easily understood by novices. But otherwise, the Proburner manual leaves much to be desired. It's terse, to say the least. And it's written for those who already understand

EPROM burners, not the novice. Proburner designer Peter Thompson tells me that rewriting the manual for a less-experienced reader is currently his main priority. But for the experienced user, Proburner is much easier to understand and operate than all others I've seen for the home market.

Specify your computer model when you order a Proburner. The XE version required the addition of a smaller capacitor to reduce signal noise—it will run happily on the older models but the 800XL version is not compatible with the 130XE.

Proburner opens the door for Atari users to get into the mysteries and joys of chip burning without seriously damaging their pocketbooks or causing severe frustration. I recommend it highly.

Proburner is available from Thompson Electronics, 1074 Kensington Avenue, Suite 188, Buffalo, New York, New York 14215. Telephone (416) 960-1089. The cost is \$149, 32K cartridge.



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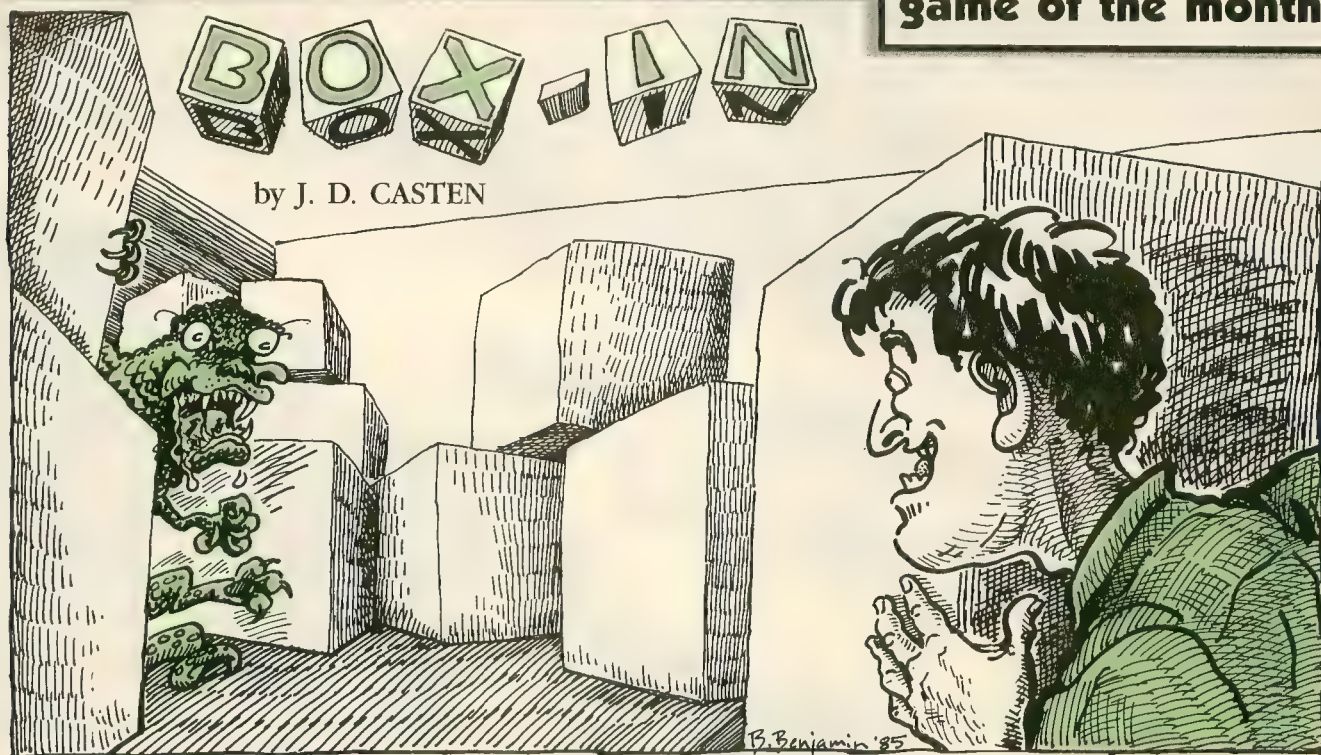
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by J. D. CASTEN

You'll find an intriguing combination of arcade action and strategy challenge in this simple but highly involving game from the author of *Biffdrop* and other *Antic* bits. The BASIC program works on all Atari computers of any memory size, with disk or cassette.

We were making one of our regular bi-monthly phone calls to J.D. Casten in Eugene, Oregon, nagging him about when was he going to turn in another great Atari game. J.D. mentioned that he'd been going through his records and he wondered what became of his first game ever accepted by *Antic*—*Box-In*—late in 1983 when he was a high school freshman.

*Box-In*?? No current *Antic* Editor had been with the magazine back in '83. We swiftly ransacked our file cabinets and found only a cryptic notation that such a game had been accepted. There was absolutely no trace of the game itself and we urged Casten to send us another disk ASAP.

In due course, the package arrived. We read J.D.'s typically bizarre game scenario, booted *Box-In*, and within a few minutes we realized that *Antic* would be publishing a

Casten game in our Christmas issue for the second consecutive year.

But wait, there was still more. The disk also included a slick new enhancement of *Biffdrop* (*Antic*, December 1984) with moving obstacles that would look right at home in *Blue Max 2001*. We took this game down the hall to the *Antic* Catalog, and now an APX Classics All-Casten Disk is in the works for the first quarter of '86.

This new collection will feature a never-before published game plus enhanced versions of *Antic*'s complete Casten game library—including *Risky Rescue* (April, 1984), *Escape From Epsilon* (June, 1984) and *Advent X-5* (December, 1984). By the way, if you've been trying to type in J.D.'s golden oldies, you'll find *TYPO II* line codes in the July, 1985 issue.

—ANTIC ED

Crazy Harold loves a thrill. So he puts himself into a room with a yucky green Harold-eating monster named Gruck.

Also in this room are 100 boxes. Not just any boxes, mind you. These are the large, solid, cube-shaped, yucky green Harold-eating monster-repellent type of box.

Harold attempts to trap Gruck with

the boxes before Gruck turns him into monster mulch. Harold does this by pushing the boxes around Gruck until the monster cannot make a move (including diagonally). At the same time, Gruck—using more than his eyes, but less than his brain—ominously moves around searching for a quick Harold snack.

## USING BOX-IN

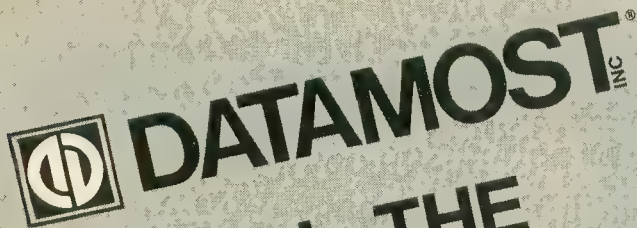
Who will help Harold survive his thrill? Enter our hero, J. Q. Public. Type in Listing 1, check it with *TYPO II* and *SAVE* a copy before you *RUN* it.

[*SELECT*] a difficulty level. The higher the difficulty the slower you go and the faster Gruck goes. [*START*] the game and use the joystick to move Crazy Harold (remember diagonals).

Even if arcade games are the bane of your existence, I highly suggest you try this one out. I have found that many people who dislike arcade action games enjoy *Box-In*. Probably that's because even though Gruck may not be the fastest-moving monster around, you'll discover that you need to use plenty of strategy in order to protect Harold with the boxes.

Listing on page 93





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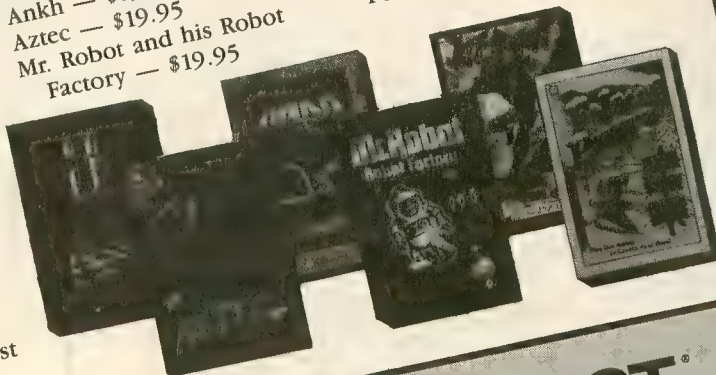
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# TYPING SPECIAL ATARI CHARACTERS

**Antic** printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

```

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9



```

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below. (Squares are drawn around the normal video characters so you can see their positions more accurately, these squares will not appear in listings.)

| NORMAL VIDEO |           |          |            |
|--------------|-----------|----------|------------|
| FOR THIS     | TYPE THIS | FOR THIS | TYPE THIS  |
| ☐            | CTRL ,    | ☐        | CTRL T     |
| ☐            | CTRL A    | ☐        | CTRL U     |
| ☐            | CTRL B    | ☐        | CTRL V     |
| ☐            | CTRL C    | ☐        | CTRL W     |
| ☐            | CTRL D    | ☐        | CTRL X     |
| ☐            | CTRL E    | ☐        | CTRL Y     |
| ☐            | CTRL F    | ☐        | CTRL Z     |
| ☐            | CTRL G    | ☐        | ESC ESC    |
| ☐            | CTRL H    | ☐        | ESC CTRL - |
| ☐            | CTRL I    | ☐        | ESC CTRL = |
| ☐            | CTRL J    | ☐        | ESC CTRL + |
| ☐            | CTRL K    | ☐        | ESC CTRL * |
| ☐            | CTRL L    | ☐        | CTRL .     |
| ☐            | CTRL M    | ☐        | CTRL ;     |
| ☐            | CTRL N    | ☐        | SHIFT =    |
| ☐            | CTRL O    | ☐        | ESC        |
| ☐            | CTRL P    | ☐        | SHIFT      |
| ☐            | CTRL Q    | ☐        | CLEAR      |
| ☐            | CTRL R    | ☐        | ESC DELETE |
| ☐            | CTRL S    | ☐        | ESC TAB    |

| INVERSE VIDEO |           |          |            |
|---------------|-----------|----------|------------|
| FOR THIS      | TYPE THIS | FOR THIS | TYPE THIS  |
| ☐             | CTRL ,    | ☐        | CTRL Y     |
| ☐             | CTRL A    | ☐        | CTRL Z     |
| ☐             | CTRL B    | ☐        | ESC        |
| ☐             | CTRL C    | ☐        | SHIFT      |
| ☐             | CTRL D    | ☐        | DELETE     |
| ☐             | CTRL E    | ☐        | ESC        |
| ☐             | CTRL F    | ☐        | SHIFT      |
| ☐             | CTRL G    | ☐        | INSERT     |
| ☐             | CTRL H    | ☐        | ESC        |
| ☐             | CTRL I    | ☐        | CTRL       |
| ☐             | CTRL J    | ☐        | TAB        |
| ☐             | CTRL K    | ☐        | ESC        |
| ☐             | CTRL L    | ☐        | SHIFT      |
| ☐             | CTRL M    | ☐        | TAB        |
| ☐             | CTRL N    | ☐        | CTRL .     |
| ☐             | CTRL O    | ☐        | CTRL ;     |
| ☐             | CTRL P    | ☐        | SHIFT =    |
| ☐             | CTRL Q    | ☐        | ESC CTRL 2 |
| ☐             | CTRL R    | ☐        | ESC        |
| ☐             | CTRL S    | ☐        | CTRL       |
| ☐             | CTRL T    | ☐        | DELETE     |
| ☐             | CTRL U    | ☐        | ESC        |
| ☐             | CTRL V    | ☐        | CTRL       |
| ☐             | CTRL W    | ☐        | INSERT     |
| ☐             | CTRL X    |          |            |

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key  instead.) Note: In the printed listings, inverse characters will be slightly smaller than the normal ones.

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be *thicker* than the alpha-numeric. Compare the two sets of characters below:

**SPECIAL**

```

/  ☐ CTRL F
\  ☐ CTRL G
-  ☐ CTRL N
-  ☐ CTRL R
+  ☐ CTRL S

```

**STANDARD**

```

/  ☐ /
\  ☐ SHIFT +
-  ☐ SHIFT -
-  ☐ -
+  ☐ +

```

# HOW TO USE TYPO II

TYPO II is the improved automatic proofreading program for Antic's type-in BASIC listings. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at left of the line number. Press [RETURN].

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [\*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:"). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:"). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Owners of the BASIC XL cartridge from O.S.S. type SET 5,0 and SET 12,0 before using TYPO II.

Don't type the  
TYPO II Codes!

Don't type the  
TYPO II Codes!

```

WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINES(120):CLOSE #2:CLO
SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPO II"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
$:IF LINES$="" THEN POSITION 2,4:LIST B
:GOTO 32060
XH 32070 IF LINES(1,1)="*" THEN B=VAL(LIN
ES(2,LEN(LINES))):POSITION 2,4:LIST B:
GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINES):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
    
```

```

ET 32120 ? "K":POSITION 11,1:? "TYPO II"
":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINES:IF
LINES="" THEN ? "LINE ";B;" DELETED":G
OTO 32050
VV 32150 FOR D=1 TO LEN(LINES):C=C+1:ANS=
ANS+(C*ASC(LINES(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
(LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
t match press [RETURN] and edit line a
bove.":GOTO 32050
    
```

## ERROR FILE

### ATARI 'TOONS

August 1985

The 22nd character in line 1090 of listing 2 is an A. Also, to load non-standard character sets, change NUMBER=1024 in line 1140 to: NUMBER=2050, and change line 1150 to: 1150 GOTO 1170.

### GUESS THAT SONG

July 1985

The September, 1985 HELP! section contains an easier-reading listing of some of the tougher data lines in Guess That Song.

### STAR VENTURE

July 1985

Change line 380 to:

```

380 IF PEEK(53279)
=6 THEN SOUND 0,
0,0,0:GOTO 80
    
```

### MUSICIAN

June 1985

Change line 790 to:

```

790 IF A=54 THEN
POSITION 4,22:? #
6;"Song cleared":
GOTO 810
    
```

And if you're having tempo problems, remove line 1720 and add the following:

```

1715 IF A=14 THEN
TEMPO=-0.25:GOTO
1700
    
```

```

1720 REM REMOVE T
HIS LINE
    
```

### MANEUVER

April 1985

If you get hearts on the title screen, LIST the program to disk or cassette, type NEW, then ENTER and SAVE it.

### FONT MAKER FOR SG-10

March 1985

The July 1985 issue of ANTIC contains a listing which, when merged with FONT MAKER,

makes that program work on the Star SG-10. See the HELP section of that issue for instructions.

### CUSTOM PRINT

March 1985

Custom Print has problems printing certain characters using re-defined characters. Change line 5 to:

```

5 C5=PEEK(106)-8:
POKE 106,C5-1:GRA
PHICS 0:DIM CST$(
20):CST$=""
    
```

Antic super-utility now even better

# DISKIO PLUS

Article on page 26

## LISTING 1

Don't type the  
TYPO II Codes! 

```
RS 10 REM DISKIO PLUS, LISTING 1
OK 15 REM BY PATRICK DELL'ERA
OZ 20 REM (BASIC LOADER BY C. JACKSON)
FW 30 REM (C) 1985, ANTIC PUBLISHING
MF 40 DIM FNS(20),TEMPS(20),ARS(93)
YQ 50 ? "DISKIO PLUS FILE CREATOR"
JO 55 TLOC=PEEK(10592):POKE 10592,255
YM 60 ? :? "Output filename":INPUT FNS
UK 70 IF FNS(1,1)="D" AND (FNS(2,2)=":" OR
    R FNS(3,3)=":") THEN 90
MH 80 TEMPS(1,2)="D":TEMPS(3)=FNS:FNS=TE
    MPS
WD 90 ? :? "Configure for BASIC or Assemb
    ler":INPUT TEMPS
OM 92 IF TEMPS="B" THEN CNF=0:GOTO 99
PD 94 IF TEMPS="A", THEN CNF=1:GOTO 99
YE 96 ? "++":GOTO 90
LP 99 TRAP 160:POKE 10592,TLOC
PX 100 ? :? :? "Working...Please stand by
    "
LO 110 RESTORE :READ LN:LN=LN:DIM AS(LN):
    C=1
BI 120 ARS="":READ ARS
XU 130 FOR X=1 TO LEN(ARS) STEP 3:POKE 75
    2,255
DE 140 LM=LM-1:POSITION 10,10:? "(Countdo
    wn...T-":INT(LM/10):" "
SU 150 AS(C,C)=CHR$(VAL(ARS(X,X+2))):C=C+
    1:NEXT X:GOTO 120
FI 160 IF CNF=1 THEN AS(1929,1929)="a":AS
    (1942,1942)=" ":AS(3270,3274)="65535"
TT 170 IF PEEK(195)=5 THEN ? :? "TOO MAN
    Y DATA LINES!!!":? "CANNOT CREATE FILE
    !":END
YK 200 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!!!":? "CANNOT CREATE FILE!":END

DH 210 CLOSE #1:OPEN #1,0,FNS:POKE 766,
    1:? #1:AS::CLOSE #1:POKE 766,0
RU 220 GRAPHICS 0:? "XXXXXXXXXX"
JW 1000 DATA 3660
VN 1010 DATA 2552550000481820481121121121
    12112112112071025048112112112006112112
    112002112002112002065000048
LM 1020 DATA 0000001001051151071051110002
    4023624524300000000034057000048014044
    014000036037044044007037050
GE 1030 DATA 0330000000000000099000000330
    46052041035000045033039033058041046037
    012000017018015024021000000
EU 1040 DATA 00000000000000000000000000
    0000000000034097115101100000111110000
    000000000000000000000000000000
XR 1050 DATA 0000000000360410510430410470
    0009812100003611401400003410114110097
    114100000047112112101110104
HO 1060 DATA 1011051090001690331410470021
    69000141048002169048141049002169004141
    19800214120002173197002141
EA 1070 DATA 1990020962240022270020760421
    53048109029239042172170029169255153026
    003169255153027003173143029
UK 1080 DATA 1330101731440291330111731460
    29133012173147029133013076255255032255
    255044096041048029169145133
CM 1090 DATA 0121690291330131691091330101
    69029133011160255169093153026003200169
```

```
029153026003096032233030162
RJ 1100 DATA 0320322350301600001850970410
    32190030200201155208245032154030160255
    104200153210000192023208247
LA 1110 DATA 1041701041681691550400960322
    55255008201155208246152072138072160023
    185218000072136016249173072
CH 1120 DATA 00305622904024020081410950411
    69229133223169041133224162255134220232
    134233160255230220200204095
LW 1130 DATA 0412400021760161772230480262
    40172185128005032177030209223240232200
    177223016251200200200152032
GR 1140 DATA 1420302082141851280050321770
    30073128209223208235200044096041016023
    169035197223240017076207029
HR 1150 DATA 0411272010481440062010581760
    02056096024096174095041169155157128005
    189128005032177030157128005
UW 1160 DATA 2020162441690001332341332391
    69029072169182072177223072200132222177
    223072096024101223133223169
IB 1170 DATA 0001012241332240961692551412
    52002169005141066003133034169128141068
    003169005141069003096201155
LO 1180 DATA 2400080411272010651440020410
    95096153128005230036198040206072003096
    169000133235185128005032086
EO 1190 DATA 0301440071410890412001051280
    05201047208008200185128005009128133235
    096162016169012157066003076
MO 1200 DATA 0862281691281600051620001570
    68003152157069003169128157072003169000
    157073003169009157066003076
DK 1210 DATA 1920401410280311400290311602
    55200185128005153188005016247073120153
    188005200169032153188005200
TX 1220 DATA 1400770311691801600050760660
    31169155162000072169000240012162000072
    157068003152157069003169128
AV 1230 DATA 1570720031690001570730031690
    11157066003104076192040133237132238032
    066031165237164238162016036
LL 1240 DATA 2390480040362350482080961420
    77031133223132224172077031136177223153
    226005136016248169226160005
II 1250 DATA 0760660311620081691111600410
    72152072138072162016032235030174155031
    104157074003104157069003104
YP 1260 DATA 1570680031690031570660030761
    92040162058169168236170005240002169165
    160005096160003032201030032
OJ 1270 DATA 1440330160131691651600020322
    35035032182031076223031169088160041162
    006032149031016001096169125
ZZ 1280 DATA 0320590311690001332191332230
    24165014133227105018133231165015133228
    105000133232162016169019024
OJ 1290 DATA 1012271332271570680031690001
    01228133228157069003165227056233001133
    229165228233000133230169005
TP 1300 DATA 1570660031690181570720030321
    92040189072003201017240054160000177227
    200145227230219169040197219
YU 1310 DATA 2400391652232480241050012161
    33223072041240074074074074009048201048
    208002169032160000145229200
```

JN 1320 DATA 1040410150090481452290760030  
32036235016007036239048003032143031165  
229072165230072162000134233

JV 1330 DATA 2321652310241050011332291652  
32105000133230165219201002176007201001  
240065076098033024165229133

QH 1340 DATA 2271050191332291652301332281  
05000133230160002177229209227144009208  
026200192013176021144241169

SV 1350 DATA 0011332331600161772290721772  
2714522910414522713620824323228219208  
198165233208163165231133227

YA 1360 DATA 1332291652321332281332301652  
19072074105000133223170104056229223133  
224165229024105019133229169

ZH 1370 DATA 0001012301332302022082401690  
01133085133082169018141077031036223048  
075198223048071165227164228

KV 1380 DATA 0320950311690191410770310241  
01227133227169000101228133228036224048  
221198224048217169002141077

CM 1390 DATA 0311690191600410320950311690  
19141077031165229164230032095031165229  
024105019133229169000101230

KP 1400 DATA 1332300760140331690021330851  
33082169018141077031104133224104133223  
160000169155145223165219106

MS 1410 DATA 1760081690010321420302060770  
31165223164224032095031076183037160255  
162001232189128005201032240

AM 1420 DATA 0122010442400082360950412082  
39169000096200232189128005192001208012  
201058208008072169049153168

CV 1430 DATA 0052001041531680052360950412  
08227169155153168005096032144033048001  
096169032016032169033016026

ZL 1440 DATA 1690350160241690360160201600  
06032201030169033141090003169254036235  
016002169253198233133218032

TK 1450 DATA 2330300362390480251652200101  
68185203041072185204041168104198084032  
018031036218016003076007035

HG 1460 DATA 1730950412010031760010961731  
30005032086030176067201058240060201068  
208019173131005201058240036

NL 1470 DATA 0320860301440071731320052010  
58240024162020189130005157131005202016  
247160002032233035200185130

LH 1480 DATA 0050480130162481602552001851  
30005153128005016247132238076018035041  
031201016208002169000133236

DM 1490 DATA 1731310050410311332372010160  
40011201026016007173095041201003208008  
165236133237169128133236056

MU 1500 DATA 1650882330191332231650892330  
00133224169020032142030160001177223240  
104197237208241136165236041

LE 1510 DATA 1272092232082322002001772232  
4000420101020822169128133227169005133  
228160003177223240039024105

DK 1520 DATA 0321452272001920112400211920  
14208238136169046209227240001200169155  
145227132238076007035169046

LP 1530 DATA 1452272302272082131920111762  
27169046145227200192011240200198227208  
247160002036218016002160006

OW 1540 DATA 0322330351652182010102400042  
01032208120160000173128005141165005200  
185128005201058208003169049

SG 1550 DATA 1361411660052001851280051411  
67005165218201010240020198234162004169  
165160005032149031008032233

KY 1560 DATA 0300400480101620231690211600  
41032117031096160002200185128005201155  
240008201032240004201044208

IF 1570 DATA 2401690321531280051620031652  
18201032240014169058205169005240007205  
170005240002162000200189165

RB 1580 DATA 0052321531280052011552082441  
6521820103217600109603224303036233016  
003032196035162016165218157

PZ 1590 DATA 0660031690001570730031690401  
57072003169128157068003169005157069003  
032192040096162017169111160

ZU 1600 DATA 0410321170311692551412520022  
05252002240251173252002041063072032057  
031104201043208001096104104

IU 1610 DATA 0961691281332271690051332281  
85088041145227136016248096174095041224  
003176001096162000160255232

PK 1620 DATA 1891280050480112010442082460  
72169155157128005104200153208005201155  
240007232189128005076023036

HF 1630 DATA 1690010322450331690340320590  
31160000200185128005016250169034153128  
005162255232200189208005153

QH 1640 DATA 1280050162460322430300321960  
35165220010168185203041133227185204041  
133228162030160036189128005

QR 1650 DATA 1531280051362020162461620051  
600001772270411270321903020202016245  
136173044036032190030200185

BW 1660 DATA 1280050162471400950410761470  
39169000133235160002200185128005201047  
208047185129005141168005009

ZR 1670 DATA 1281332350320860301440071691  
55153128005048044169058141169005169155  
141170005153128005185130005

VS 1680 DATA 0480540410011412540020160472  
01032240004201044208006032144033076249  
036204095041208182169000032

SV 1690 DATA 2450331602552001851280051531  
68005016247165235016005041127141169005  
032057031169010032245033036

FM 1700 DATA 2390480060322430300321960351  
60255200185128005048011201042240004201  
063208242076188037165235041

CL 1710 DATA 1271332262080221741700051731  
69005224058240003173166005205129005208  
004009128133226169016133225

HP 1720 DATA 0362260160050320160382080891  
69032141155031169128160005162004032149  
031032036038036226016005032

VV 1730 DATA 0280382080631652350160202012  
08208006032143031076143037201211208006  
169000133225240023032182031

LK 1740 DATA 1620080321490310761430370320  
36038036226016005032028038208016032068  
038036233048009036226016233

KD 1750 DATA 0320160382402280322330301620  
32032235030169000141254002165233016007  
201136240003076219040036239

WB 1760 DATA 0480180961692551332391690481  
33240133241169128160005076223031230241  
165241201058208004230240169

LG 1770 DATA 0481332411411310051982190160  
01096165240141130005169046141128005169  
077141129005162047160155165

RA 1780 DATA 2350160131421320050411271411  
33005140134005016003140132005032145036  
076205037162014169044160041

XC 1790 DATA 0321170310761960351620191690  
58160041208242056173229002229014162032  
157072003173230002229015157

CI 1800 DATA 0730031650141570680031650150  
32047039132233096166225173100003157068  
003173101003157069003173104

BG 1810 DATA 0031570720031731050031570730  
03169011157066003076192040172095041136  
136185128005201047208005169

FA 1820 DATA 1551531280051332351332291690  
01032245033032243030169128160005162004  
032149031169059141224002141

TI 1830 DATA 2260021690391412250021412270  
02032028039016015201136208008036235048  
003032025039096076219040169

IL 1840 DATA 2552051280052080102051290052  
08005133229076156038036229016231173128  
005133223173129005133224032

KO 1850 DATA 0280391620161731280050562292

continued on next page

```

23157072003173129005229224157073003189
072003024105001157072003189
HV 1860 DATA 0730031050001570730031652231
57068003165224032047039048159036235048
013032022039169059141226002
VI 1870 DATA 1690391412270020761560381082
26002108224002162016169002157072003169
000157073003169128157068003
RV 1880 DATA 1690051570690031690071570660
03032086228152096169255048002169000141
096041096160004032201030173
DM 1890 DATA 0890411411570411620171691501
60041032117031032196035162008169156160
041032149031032233030096169
LI 1900 DATA 0002400061690312080021690622
06095041208059190084133223160029132224
032247030160255200177223032
KU 1910 DATA 1900302011552082461400950411
04104032154030076002030172095041136185
128005201044208014162000200
WB 1920 DATA 1891050410321900302322240062
08244104104076207029169125032059031169
255133227169229141028031169
RE 1930 DATA 0411410290312302270320240312
38077031173077031024109028031141028031
173029031105000141029031165
PO 1940 DATA 2272400442010121760460101681
73028031072173029031072185203041141028
031185204041141029031169061
ON 1950 DATA 0320590312300850320240311041
41029031104141028031032057031076204039
201016144246032057031162255
XH 1960 DATA 2321890610421571280050162470
41127157128005232169048157128005232169
032157128005162006157128005
QK 1970 DATA 1730660421602550320950401730
69042160030032095040173072042160061032
095040198084096238131005162
UM 1980 DATA 0050731281571280052322322001
85000029157128005201155208244076243030
160037204095041144091200173
TH 1990 DATA 1310050410151702020480812240
03176077169155172095041153128005169225
133223169028133224160253200
VU 2000 DATA 2002001690310321420302020162
45173133005073128153066042160255200185
135005145223201155208246096
OY 2010 DATA 0320862280362340480031520480
11169000133234169016141155031152096192
128240241104104169002133085
SL 2020 DATA 1330821921282400451521620481
60048201010144010233010200192058144245
232208240009048141086041140
DD 2030 DATA 0850412240482080021620321420
84041162011169077160041032117031096032
032156068117112108105099097
XG 2040 DATA 1161010321021051081011100971
09101046046046155060083111117114099101
03206810511510706215506008
AH 2050 DATA 1011151161051100971161051111
10032068105115107062155069114114111114
032035048048048155068049058
SG 2060 DATA 042046042155000000760730830
84049044048155051050055054055155080114
101115115002217022105102032
OD 2070 DATA 111070971210320620820690780
65077197068069076069084197076079067203
085078076079067203087082073
OD 2080 DATA 0840690320680490580680790830
46083089083155076073083084160083065086
069160069078084069210066073
YM 2090 DATA 0780650820890320760790650681
60082085078032160077079086197229041128
041134041140041144041167041
BJ 2100 DATA 1720411770411890411940411820
41199041150041070079082077065212033224
046206033202046196033212046
KG 2110 DATA 2030332160462130332200462160
35249046211035249046197035249046204035
249046210035249046194038101
CH 2120 DATA 0462050361400680732100311950

```

```

79070198039059079206039063076073083212
039154087068079211039069076
HK 2130 DATA 1740391540720690762080391840
68069198040120155039105155039109155039
113000165012141146029165013
UJ 2140 DATA 1411470291650101411430291650
11141144029160253200200200185026003201
069208246200140170029185026
KB 2150 DATA 0031332231411130291690931530
2600320018502600313322414118029169029
153026003160015177223153093
OP 2160 DATA 0291360162481730970290241050
01141227029173098029105000141228029169
225141097029169029141098029
QE 2170 DATA 1690761412310021690421412320
02165012141146029165013141147029169155
141000029141031029141062029
RW 2180 DATA 1690001330201691282381990021
97020176249162000142155031032235030169
105160042162012032149031076
WE 2190 DATA 148029

```

## LISTING 2

```

CN 10 REM DISKIO PLUS MACRO SAVER
QB 20 REM BY PATRICK DELL'ERA
FW 30 REM (c) 1985, ANTIC PUBLISHING
ZG 50 DIM KEYBFFRS(31*3),TEMPS(31),KEY(2)
,FILES(20)
SZ 60 KEYBFFRS=CHRS(155):KEYBFFRS(31*3)=K
EYBFFRS:KEYBFFRS(2)=KEYBFFRS
II 70 CLOSE #1:OPEN #1,4,0,"E:"
UP 80 POKE 710,4:POKE 712,4
TK 90 GOSUB 490
LW 100 FOR X=1 TO 31*3
TC 110 KEYBFFRS(X,X)=CHRS(PEEK(7423+X))
LP 120 NEXT X
CK 130 ?
QT 140 FOR X=0 TO 2
JS 150 KEY(X)=PEEK(10818+X*3)
BU 160 ? "DEF";X+1;" ";CHRS(KEY(X)-128);"
";
JA 170 Y=1+X*31
AQ 180 ? #1:KEYBFFRS(Y,Y);
SQ 190 IF ASC(KEYBFFRS(Y,Y))<>155 THEN Y=
Y+1:GOTO 180
LM 200 NEXT X
CH 210 ?
LO 220 ? "Enter filename for saving:":? ">";
GO 230 X=PEEK(10592):POKE 10592,255
YC 240 INPUT #1:TEMPS
PE 250 POKE 10592,X
OU 260 FILES="D1:":IF TEMPS(2,2)="" OR T
EMPS(3,3)="" THEN FILES=TEMPS:GOTO 28
0
HO 270 FILES(4)=TEMPS
IX 280 X=1
GY 290 IF X>LEN(FILES) THEN 320
DY 300 IF FILES(X,X)="" THEN 320
YP 310 IF X<12 THEN X=X+1:GOTO 290
JJ 320 FILES(X)="KEY"
EK 330 CLOSE #1:OPEN #1,8,0,FILES
DG 340 PUT #1,255:PUT #1,255
LY 350 PUT #1,0:PUT #1,29
LG 360 PUT #1,92:PUT #1,29
CK 370 FOR X=1 TO LEN(KEYBFFRS)
JZ 380 PUT #1,ASC(KEYBFFRS(X,X))
MF 390 NEXT X
UZ 400 A=63
QQ 410 FOR X=0 TO 2
NH 420 A=A+3
PJ 430 PUT #1,A:PUT #1,42
PL 440 PUT #1,A:PUT #1,42
QR 450 PUT #1,KEY(X)
MA 460 NEXT X
LO 470 CLOSE #1

```

```

OJ 480 END
YH 490 ? "K      DISKIO PLUS: "
NK 500 ? "      KEY MACRO SAVE UTILITY: "
JP 510 ? "      by Patrick Dell'Era+++"
HA 520 ? "Current Keyboard Macro Definiti
ons:"
ZH 530 RETURN

```

## LISTING 3

```

ZF 2 REM DISKIO PLUS, LISTING 3
DQ 4 REM BY PATRICK DELL'ERA
FG 6 REM (C) 1985, ANTIC PUBLISHING
LP 10 GRAPHICS 0
UB 20 POKE 752,1:POKE 712,4:POKE 710,4
VQ 30 ? :? :? :? , " DISKIO PATCH "
FW 40 ? :? :? , "      by"
AK 50 ? :? :? , "P.L. Dell'Era"
FV 60 ? :? :?
CH 70 ? "This patch makes DISKIO compatib
le"
AZ 80 ? "with both DOS 2.05 and 2.5."
IW 90 ? "It is assumed that DISKIO is cal
led"
FR 100 ? "AUTORUN.SYS in Disk Drive 1."
YU 110 ? :? :? "When you are ready, press S
ORT..."
TB 120 IF PEEK(53279)<>6 THEN 120
UE 130 CLOSE #1:OPEN #1,12,0,"D:AUTORUN.S
YS"
PH 140 FOR X=1 TO 4:GET #1,A:NEXT X
YP 150 ? #1;CHR$(140);CHR$(41);
CN 160 FOR X=1 TO 2541:GET #1,A:NEXT X
AR 170 FOR X=1 TO 35
SW 180 READ A
EC 190 ? #1;CHR$(A);
LM 200 NEXT X
IJ 210 FOR X=1 TO 537:GET #1,A:NEXT X

```

```

TN 220 FOR X=1 TO 6
SN 230 READ A
DT 240 ? #1;CHR$(A);
LW 250 NEXT X
PG 260 CLOSE #1:OPEN #1,9,0,"D:AUTORUN.SY
S"
FT 270 FOR X=1 TO 88
SX 280 READ A
ED 290 ? #1;CHR$(A);
LN 300 NEXT X
LB 310 CLOSE #1
SU 320 ? :?
IZ 330 POKE 752,0
DB 340 ? "The Patch has been installed..."
OC 350 END
GU 360 DATA 68,73,83,75,73,79,32,52,46,51
PT 370 DATA 49,32,45,45,79,112,112,101,11
0,104
PC 380 DATA 101,105,109,32,38,32,68,101,1
08,108
UU 390 DATA 39,69,114,97,155
CM 400 DATA 162,12,236,171,25,240,46,162,
15,169
HK 410 DATA 156,72,138,10,168,185,107,41,
133,208
KJ 420 DATA 185,108,41,133,209,160,0,104,
72,145
TD 430 DATA 208,202,240,10,224,6,208,230,
104,169
BN 440 DATA 166,72,208,224,104,169,146,14
1,79,38
WG 450 DATA 141,92,38,76,13,29,53,36,144,
36
BH 460 DATA 1,37,190,37,89,38,106,38,56,3
1
VQ 470 DATA 212,31,197,35,226,35,32,36,14
7,36
OF 480 DATA 222,36,4,37,142,37,193,37,226
,2
UV 490 DATA 227,2,53,41

```

chip programming for \$30

# BUILD YOUR OWN EPROM BURNER

Article on page 69

## LISTING 1

```

10 ;EPROG
20 ;BY LARRY A. WOODGEARD
30 ;(C) 1985, ANTIC PUBLISHING
40 ;DEFAULT 2764
50      *= $6800
60 ADDR1 = $CE
70 ADDRH = $CF
80 CLK = $10
90 RW1 = $20
0100 RW2 = $40
0110 EW = $80
0120 PORTA = $D300
0130 PACTL = $D302
0140 DSUM = $CD
0150 ;EPROM=$6123 FOR 2764
0160 ;EPROM=$612B FOR 2732
0170 ;EPROM=$6133 FOR 2716
0180 EPROM = $6123
0190 GBUF = $6360

```

```

0200 GBUF1 = $60
0210 GBUFH = $63
0220 VADDR1 = $CE
0230 VADDRH = $CF
0240 IOCB2 = $20
0250 ICCOM = $0342
0260 ICBAL = $0344
0270 ICBH = $0345
0280 ICBLL = $0348
0290 ICBLLH = $0349
0300 ICAX1 = $034A
0310 ICAX2 = $034B
0320 CIOV = $E456
0330 ADTEXL = $CB
0340 ADTEXH = $CC
0350      JMP EPTYPE
0360 READR
0370 ;READ ROUTINE
0380      LDA #500

```

continued on next page

```

0390      STA ADDRL
0400      LDA #570
0410      STA ADDRH
0420 READ LDX #57F
0430      JSR PORTMODE
0440      JSR ADDRROUT
0450      LDX #570
0460      JSR PORTMODE
0470      LDA #RW1
0480      JSR CLKOUT
0490      LDA #50F
0500      AND PORTA
0510      STA D5UM
0520      LDA #RW1+RW2
0530      JSR CLKOUT
0540      LDA #50F
0550      AND PORTA
0560      CLC
0570      ASL A
0580      ASL A
0590      ASL A
0600      ASL A
0610      CLC
0620      ADC D5UM
0630      LDY #500
0640      STA (ADDRL),Y
0650      INC ADDRL
0660      BNE READ
0670      INC ADDRH
0680      LDA ADDRH
0690      CMP #590
0700      BNE READ
0710      LDX #500
0720      JSR PORTMODE
0730      BRK
0740 ;ADDRROUT SUBROUTINE
0750 ADDRROUT
0760      LDA #5F0
0770      AND ADDRH
0780      JSR DIV16
0790      SEC
0800      SBC #507
0810      JSR CLKOUT
0820      LDA #50F
0830      AND ADDRH
0840      JSR CLKOUT
0850      LDA #5F0
0860      AND ADDRL
0870      JSR DIV16
0880      JSR CLKOUT
0890      LDA #50F
0900      AND ADDRL
0910      JSR CLKOUT
0920      RTS
0930 ;CLOCK REGISTERS SUBROUTINE
0940 CLKOUT
0950      ORA #500
0960      STA PORTA
0970      LDX #510
0980 DELAY1 DEX
0990      BNE DELAY1
1000      ORA #CLK
1010      STA PORTA
1020      LDX #510
1030 DELAY2 DEX
1040      BNE DELAY2
1050      AND #5EF
1060      RTS
1070 ;PORT DIRECTION SUBROUTINE
1080 PORTMODE
1090      LDA #538
1100      STA PACTL
1110      STX PORTA
1120      LDA #53C
1130      STA PACTL
1140      RTS
1150 ;DIVIDE BY 16 SUBROUTINE
1160 DIV16
1170      CLC
1180      LSR A
1190      LSR A
1200      LSR A
1210      LSR A
1220      CLC
1230      RTS
1240 PROGRAM
1250 ;PROGRAM ROUTINE
1260      LDA #500
1270      STA ADDRL
1280      LDA #570
1290      STA ADDRH
1300      LDX #5FF
1310      JSR PORTMODE
1320      LDA #500
1330      STA PORTA
1340      JSR SWPROG
1350 PROGRAM
1360      LDY #500
1370      LDA (ADDRL),Y
1380      AND #5F0
1390      JSR DIV16
1400      JSR CLKOUT
1410      LDY #500
1420      LDA (ADDRL),Y
1430      AND #50F
1440      JSR CLKOUT
1450      JSR ADDRROUT
1460      LDA #500
1470      STA PORTA
1480      JSR DELAY
1490      LDA #500
1500      STA PORTA
1510      INC ADDRL
1520      BNE PROGRAM
1530      INC ADDRH
1540      LDA ADDRH
1550      CMP #590
1560      BNE PROGRAM
1570      JSR PROGEND
1580      LDX #500
1590      JSR PORTMODE
1600      BRK
1610 DELAY
1620      LDX #500
1630 START LDY #501
1640 DELAY3 DEY
1650      BNE DELAY3
1660      DEX
1670      BNE START
1680      RTS
1690 CKEY
1700      LDA #TEXT6&255
1710      STA ADTEXL
1720      LDA #TEXT6/256
1730      STA ADTEXH
1740      JSR PRINTSCR
1750 CH LDA $D01F
1760      CMP #506
1770      BNE CH
1780      RTS
1790 ;EPROM VARIABLES
1800 EPVAR LDA #560
1810      STA VADDRH
1820      LDY #500
1830      LDX #500
1840 VLOOP LDA VADDR,X
1850      STA VADDRL
1860      LDA EPROM,X
1870      STA (VADDRL),Y
1880      INX
1890      CPX #508
1900      BNE VLOOP
1910      RTS
1920 EP64 .BYTE $70,$07,$00,$70,$00,$8
0,$00,$01
1930 EP32 .BYTE $80,$08,$00,$80,$00,$8
0,$00,$28
1940 EP16 .BYTE $88,$08,$80,$88,$80,$8
0,$80,$28
1950 VADDR .BYTE $08,$55,$73,$A3,$AC,$
CC,$D4,$F0

```

```

1960 OPENSER
1970     LDH #IOCB2
1980     LDA #503      OPEN CMD
1990     STA ICCOM,X
2000     LDA #DEVNAM&255
2010     STA ICBAL,X
2020     LDA #DEVNAM/256
2030     STA ICBAL,X
2040     LDA #50C      WRITE CMD
2050     STA ICAH1,X
2060     LDA #500
2070     STA ICAH2,X
2080     JSR CIOV
2090     RTS
2100 PRINTSER
2110     LDH #IOCB2
2120     LDA #50B      PUT CHARACTER
2130     STA ICCOM,X
2140     LDA ADTEXL
2150     STA ICBAL,X
2160     LDA ADTEXH
2170     STA ICBAL,X
2180     LDY #500      DETERMINE LENGTH
2190 TY     LDA (ADTEXL),Y
2200     CMP #57C
2210     BEQ PRINT
2220     INY
2230     JMP TY
2240 PRINT
2250     TYA
2260     STA ICBLL,X
2270     LDA #500
2280     STA ICBLL,X
2290     JSR CIOV
2300     RTS
2310 DEVNAM .BYTE "E:",59B
2320 CLOSE
2330     LDH #IOCB2
2340     LDA #50C
2350     STA ICCOM,X
2360     JSR CIOV
2370     RTS
2380 GETCHAR
2390     LDH #IOCB2      GET CHARACTER
2400     LDA #507      GET CMD
2410     STA ICCOM,X
2420     LDA #500
2430     STA ICBLL,X LENGTH OF INPUT
2440     LDA #502
2450     STA ICBLL,X
2460     LDA #GBUFH
2470     STA ICBAL,X DATA BUFFER LOC.
2480     LDA #GBUFL
2490     STA ICBAL,X
2500     JSR CIOV
2510     RTS
2520 EPTYPE
2530     LDA #TEXT&255
2540     STA ADTEXL
2550     LDA #TEXT/256
2560     STA ADTEXH
2570     JSR OPENSER
2580     JSR PRINTSER
2590     JSR GETCHAR
2600     LDA GBUF
2610     CMP #531
2620     BEQ EPROM1
2630     CMP #532
2640     BEQ EPROM2
2650     JMP EPROM3
2660 MODE
2670     JSR EPVAR
2680     LDA #TEXT1&255
2690     STA ADTEXL
2700     LDA #TEXT1/256
2710     STA ADTEXH
2720     JSR PRINTSER
2730     JSR GETCHAR
2740     LDA GBUF
2750     CMP #531

2760     BEQ SWRD
2770     JMP PROGRAMR
2780 EPROM1
2790     LDA #533
2800     STA $6119
2810     JMP MODE
2820 EPROM2
2830     LDA #52B
2840     STA $6119
2850     JMP MODE
2860 EPROM3
2870     LDA #523
2880     STA $6119
2890     JMP MODE
2900 SWRD
2910     LDA #TEXT2&255
2920     STA ADTEXL
2930     LDA #TEXT2/256
2940     STA ADTEXH
2950     JSR PRINTSER
2960     JSR CKEY
2970     JSR WAIT
2980     JSR CLOSE
2990     JMP READR
3000 SWPROG
3010     LDA $6119
3020     CMP #533
3030     BEQ SW1
3040     CMP #52B
3050     BEQ SW2
3060     JMP SW3
3070 SW1
3080     LDA #TEXT3&255
3090     STA ADTEXL
3100     LDA #TEXT3/256
3110     STA ADTEXH
3120     JSR PRINTSER
3130     JSR CKEY
3140     JSR WAIT
3150     RTS
3160 SW2
3170     LDA #TEXT4&255
3180     STA ADTEXL
3190     LDA #TEXT4/256
3200     STA ADTEXH
3210     JSR PRINTSER
3220     JSR CKEY
3230     JSR WAIT
3240     RTS
3250 SW3
3260     LDA #TEXT5&255
3270     STA ADTEXL
3280     LDA #TEXT5/256
3290     STA ADTEXH
3300     JSR PRINTSER
3310     JSR CKEY
3320     JSR WAIT
3330     RTS
3340 PROGEND
3350     LDA #TEXT2&255
3360     STA ADTEXL
3370     LDA #TEXT2/256
3380     STA ADTEXH
3390     JSR PRINTSER
3400     JSR CKEY
3410     JSR CLOSE
3420     RTS
3430 WAIT
3440     LDA #TEXT7&255
3450     STA ADTEXL
3460     LDA #TEXT7/256
3470     STA ADTEXH
3480     JSR PRINTSER
3490     RTS
3500 TEXT .BYTE "(1) 2716",59B,"(2) 27
32",59B,"(3) 2764",59B,"SELECT A NUMBE
R ",57C
3510 TEXT1 .BYTE 59B,"(1) READ",59B,"(
2) PROGRAM",59B,"SELECT A NUMBER ",57C

```

continued on next page

```
3550 TEXT5 .BYTE $9B,"SET SWITCH 1.4,5  
UP",$9B,$7C  
3560 TEXT6 .BYTE $9B,"PRESS RETURN TO C  
ONTINUE",$9B,$7C  
3570 TEXT7 .BYTE $9B,"ONE MOMENT PLEASE  
E...",$9B,$7C
```

# BBS CRASHBUSTER

Article on page 17

## LISTING 1

Don't type the  
TYPO II Codes!

[illegible]

```
FI 150 MAINS(55)=""  
EH 160 MAINS(115)=""  
ES 170 MAINS(175)=""  
UU 180 MAINS(228)=CHR$(155)  
TY 190 MAINS(229)=""  
NZ 200 MAINS(291)=""  
DT 210 GRAPHICS 8+16:N=USR(ADR(MAS)):REM  
CHANGE TO ANTIC "E"  
AW 220 CLOSE #1:OPEN #1,4,0,PIC$  
PT 230 A=USR(ADR(MAINS)):REM LOAD THE KOD  
LA FILE  
LG 240 CLOSE #1  
XT 250 IF PEEK(53279)<>6 THEN 250  
ST 260 GRAPHICS 0  
OF 270 END
```

## game of the month

# BOX-IN

Article on page 79

## LISTING 1

Don't type the  
TYPO II Codes!

```

VJ 1 REM BOX-IN
DY 2 REM BY J.D. CASTEN
FD 3 REM (C) 1985, ANTIC PUBLISHING
IU 5 POKE 559,M:GOTO 500
CJ 100 FOR I=1 TO W:POSITION 12,23: ? #6:P
EEK(19)::IF S=15 THEN 155
NR 105 C=71-C:LOCATE X,Y,L:IF L=32 THEN 1
45
FF 110 IF L=161 THEN 125
DN 115 IF L=132 THEN X=OX:Y=OY:GOTO 150
MO 120 GOTO 400
PB 125 X1=(OX<X)-(OX>X):Y1=(OY<Y)-(OY>Y):
X2=X:Y2=Y
TX 130 X2=X2+X1:Y2=Y2+Y1:LOCATE X2,Y2,Z:I
F Z=161 THEN 130
EU 135 IF Z=32 THEN COLOR 161:PLOT X2,Y2:
GOTO 145
HS 140 X=OX:Y=OY:GOTO 150
HV 145 COLOR 32:PLOT OX,OY:POKE 53767,143
:POKE 53767,N
NW 150 COLOR C:PLOT X,Y:OX=X:OY=Y
WR 155 S=PEEK(632):X=X+(S<8)-(S>8 AND S<1
3):Y=Y+(S=9 OR S=13 OR S=5)-(S=10 OR S
=14 OR S=6):NEXT I:H=H+SGN(X-H)

```

```

LY 170 V=V+SGN(Y-V):LOCATE H,V,L9:IF (H=0
X AND V=0Y) OR L9=C THEN 400
MH 175 IF L9=32 THEN 185
EG 180 J=H:H=0H:LOCATE H,V,L9:IF L9>128 T
HEN V=0V:H=J:LOCATE H,V,L9:IF L9>128 T
HEN H=0H:GOTO 190
B5 185 IF H<>0H OR V<>0V THEN COLOR 32:PL
OT 0H,0V:0H=H:0V=V:POKE 53279,N:COLOR
3:PLOT H,V
PD 190 FOR J=-1 TO 1:FOR I=-1 TO 1:LOCATE
H+J,V+I,L1:IF L1=3 OR L1=161 OR L1=13
2 THEN NEXT I:NEXT J:GOTO 200
MH 195 GOTO 100
GG 200 TI=PEEK(19):POSITION 3,22:? #6;"YO
U TRAPED HIM":FOR J=N TO 255 STEP 0.5:
SOUND N,J,12,15:NEXT J:POKE 53761,N
JE 205 POSITION 3,22:? #6;" PRESS START
":IF PEEK(53279)<>6 THEN 205
OA 210 TRAP 515
KW 300 FOR J=N TO 23:COLOR 32:PLOT N,J:DR
AWTO 19,J:SOUND N,30-J,8,8:NEXT J:POKE
53761,N:RETURN
XE 400 POSITION 6,22:? #6;"YOU LOSE":COLO

```

continued on next page

```

QG 530 FOR J=1 TO 77:POSITION 5,16: ? #6:
5(J,J+9):I=P:P=PEEK(53279):IF P=5 AND
I<>P THEN D=D-1:IF D=N THEN D=5
EZ 535 IF P<>6 THEN FOR K=1 TO 15:NEXT K:
POSITION 4,11: ? #6:"DIFFICULTY:":6-D:N
EXT J:GOTO 530
TV 540 GOSUB 300:COLOR 132:PLOT N,N:DRAWT
0 19,N:DRAWTO 19,21:DRAWTO N,21:DRAWTO
N,N:POKE 53768,5:POSITION 7,23
JT 545 ? #6:"TIME:":COLOR 161:FOR J=1 TO
100:X=INT(RND(0)*18+1):Y=INT(RND(0)*2
0+1):PLOT X,Y:SOUND N,8,10,8
CN 550 POKE 53761,N:NEXT J:FOR J=15 TO N
STEP -0.2:SOUND N,J,10,J:NEXT J:C=34:H
=18:V=20:OH=H:OV=V:X=1:Y=X:OX=X:OY=Y
LN 550 COLOR 34:PLOT X,Y:COLOR 3:PLOT H,V
:5=15:W=D*2-1:POKE 19,N:POKE 20,N:GOTO
100
PJ 900 DATA 255,129,189,165,165,189,129,2
55,28,28,9,127,92,28,52,6,66,36,60,90,
60,66,189,129,255,255,255,255,255,255
SJ 910 DATA 255,255,56,56,144,254,58,56,4
4,96,0

```

```

END

TO PRNT4
MAKE "A :A-192
MAKE "HCHR PIECE :A+1 :A+2 :HEX4
END

TO PRNT5
MAKE "A :A-256
MAKE "HCHR PIECE :A+1 :A+2 :HEX5
END

TO PRNT6
MAKE "A :A-320
MAKE "HCHR PIECE :A+1 :A+2 :HEX6
END

TO PRNT7
MAKE "A :A-384
MAKE "HCHR PIECE :A+1 :A+2 :HEX7
END

TO PRNT8
MAKE "A :A-448
MAKE "HCHR PIECE :A+1 :A+2 :HEX8
END

TO DUMP :B
TYPE :B TYPE [ : ]
MAKE "ASCL [- - - - -]

-- -]
PRTLN :B 16
MAKE "B :B+16
MAKE "ASCL [- - - - -]
-- -]
DUMP :B
END

TO INITALL
INIT1 INIT2 INIT3 INIT4 INIT5 INIT6 IN
IT7 INIT8
END

TO DOLINE
MAKE "A .EXAMINE :B
MAKE "VAL :A
MAKE "B :B+1
PRNT :A
MAKE "CNT :CNT-1
END

TO PRTLN :B :CNT
LABEL "PRTLN2
IF (:CNT <=0) [GO "PRTLN9]
DOLINE
GO "PRTLN2
LABEL "PRTLN9
TYPE [ ] TYPE :ASCL PRINT [ ]
END

```

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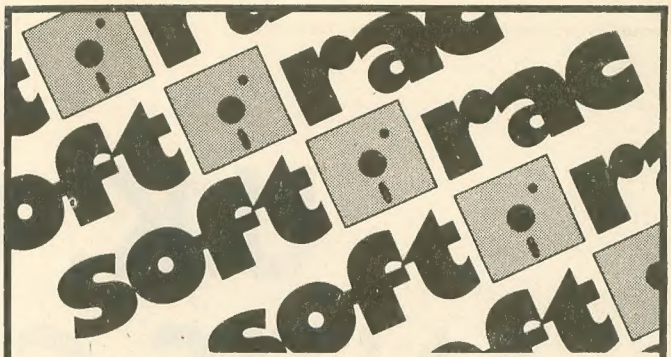
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by GIGI BISSON, *Antic* Assistant Editor

**Y**ou are holding the most expensive magazine in the United Kingdom.

That's right—*Antic*. We were surprised to learn that our British cousins were paying black market prices for their copies of "The Atari Resource." Worse yet—when they finally got *Antic* (several weeks late), the catalog stapled inside tormented them with programs they couldn't order.

Well, we have some good news for *Antic* U.K. readers. All the *Antic* Catalog software as well as the magazine itself will now be widely available throughout the United Kingdom.

Jerry Howells, General Manager of Software Express International, flew in from England to clinch the deal with *Antic*. Software Factory, his distribution company, markets a wide variety of Atari products in the British Isles, Saudi Arabia and Australia.

*Antic* Catalog software will be available for the same amount in British pounds as U.S. dollars. Due to the exchange rate, this software will now actually be cheaper in the U.K.

During his visit to San Francisco last month, Howells explained some important differences between computing in the United States and the United Kingdom.

"The British market has always been underestimated," he said. "There are computers in 25% of U.K. homes. Brits are wild about computers, but refuse to shell out a lot of money for them. Clive Sinclair's bargain-price \$49 Z81 model is still the most popular computer in the

U.K. It set a taste for cheap computers."

Now that the price of the Atari 800XL has plummeted, it's enjoying a surge of popularity overseas. The XL and XE are expected to be big hits this Christmas.

The ST is also receiving an enthusiastic welcome because of its power and a price of only 750 pounds. Howells said 140 developers are already writing software for it.

"We used to read *Antic* and wait four months for the software to come to the U.K.," he said. "Now we're getting new releases at the same time."

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